AMERICAN
GAS LIGHT JOURNAL

VOL. CIV., No. 26. NEW YORK, JUNE 26, 1916. WHOLE No. 3,042.

Gas and Other Things.
A Plea for Fair Play in Business.

ARTHUR GRAHAM GLASGOW.

Address delivered at the American Gas Centenary Celebration, Baltimore, Md.

With the rising of another sun, gas in America will become a centenarian. It is but a few years older in the mother country. The American infant, born in Baltimore one hundred years ago, is now a gigantic National institution, which brightens the life and lightens the labors of wellnigh every home and every individual in the land. But, great and beneficient as are its past achievements, the future may hold for gas still greater possibilities—depending, however, less upon the will of the gods, than upon the wisdom of our legislators.

During the past century, the introduction and development of gas in America, in common with other industries, has been left entirely to private enterprise and initiative; and the prices paid by consumers of gas were commonly fixed by the fundamental business principle of community of interest between producer and consumer, checked by competition. But competition in gas, the authority for which rests usually with our municipal councils, proved more often an instrument of speculation or blackmail than of just rate regulation, and was generally instituted for selfish ends where least justifiable. Furthermore, with the vast development of our cities, direct competition in a public convenience like gas—involving destruction of pavements, opening of streets, interruption of traffic, loss and inconvenience to citizens, and wasteful duplication of capital—has become intolerable.

All now agree that gas service should be a local monopoly; and everyone also agrees that a monopoly should be subject to reasonable regulation. But, inasmuch as gas is a great public convenience, it vitally concerns the public to provide regulation which will ensure that the gas industry is continuously stimulated to higher efficiency, and encouraged to seek and develop new and broader fields of usefulness. Moreover, gas is not a public necessity, but merely a public convenience; and, even if not subjected to direct competition in kind, is nevertheless a competitive business, exposed to all vicissitudes of competition, including obsolescence and possible loss of investment. For instance, as the result of natural gas competition, the present market value of gas scurities of the second city of the State of New York is but one-fourth of the cost of structural reproduction of the plant. In fact, most people are surprised to learn that gas, generally, is still able to hold its own against the magic development of electricity, on the one hand, and a kerosene on the other—not to speak of natural gas. And they are right to be surprised, for it has demanded surprising effort from those who are responsible for the present status of the gas industry. No industry is drawing more exhaustively on the world's resources of science and technology than is the gas industry of to-day; no industry is now administered with greater ability and initiative; and no industry practices community of interest between consumer and producer to so remarkable an extent. This technical, administrative and financial talent is serving in gas channels in the expectation of obtaining a return equal to the net market value of such services in other lines of endeavor; and, if such fair return, when otherwise earned, be witheld by unreasonable legislation, this talent will inevitably desert the gas business for other channels of similar usefulness but greater compensation. Our aim, therefore, should be to provide regulation which will leave the gas industry attractive to technical, administrative and financial talents, and thus ensure its continued maximum usefulness as a public convenience, while protecting the consumer against paying more than the fair market value for such service, all things considered.

THE SLIDING SCALE.

British experience of the past fifty years in successful gas regulation offers a practical solution of this complex problem; but our legislators are not much inclined to profit by the experience of the other Nations. They seem to prefer trial and error of their own devising, and they certainly provide us with plenty of the latter. When England originated the system of regulated monopoly for gas undertakings, she recognized the rights that private enterprise had lawfully acquired in establishing and developing gas businesses, and selected 10% as a fair "standard dividend" on capital invested at that time. To stimulate higher administrative efficiency, a "sliding scale" was added, under which five-sixth of all savings now go to the gas consumer and one-sixth to the gas company owner. In the case of the London companies this resulted ultimately in dividends of 15% upon this "original" capital. This "sliding scale" is merely a legalized and specific expression of that community of interest between consumer and producer, which, in private enterprise, finds expression in the policy of quick sales and small profits as the soundest business principle.

All new stock issued from the date of this legislation has to be sold by auction, and the whole of the sum realized must be invested in the gas undertaking. Hence, the respective municipalities or gas consumers could buy this new stock, if they so desired, at the price of issue; and thus own, at actual structural cost, all of the growth of the gas industry subsequent to the date of this legislation.

The joint aim of this British legislation was to safeguard both the future of the gas consumer and the then vested rights of the gas owner; to prevent future melon-cutting, while avoiding retroactive legislation that impaired existing property rights; and, as compensation for subjecting gas companies to such rate regulation, Parliament gives them a local monopoly.

Where British municipalties have purchased gas undertakings from private companies, under Compulsory Purchase Acts of Parliament, the price has been determined (by equal arbitration) upon the basis of *earning capacity*, with appropriate adjustment for expenditure versus earnings in the near future. If extraordinary maintenance expenditure, or further capital expenditure, is necessary to maintain the current rate of earnings, an equivalent sum is deducted from the price fixed by the earning capacity; if, on the other hand, future growth in earnings has been already paid for by judicious capital expenditure in the past, an equivalent sum is added to the price fixed by earnings. Thus, structural capacity and efficiency are properly recognized as essential factors in establishing the value of a gas undertaking, but not as the controlling factor, which is always the actual earning capacity.

Moreover, Parliament allows the shareholders as much as 10% additional as compensation for compulsory disturbance of investment, as well as annuities to directors and officials as compensation for loss of occupation.

That it pays to be honest is demonstrated by the fact that, at the outbreak of the war, Great Britain had the cheapest gas service in the world.

Commission Decisions Confiscatory.

In America, on the other hand, a distinctive confiscatory attitude is assumed by most of our commissions. The value of a business is its sustained earning capacity, and no business is of any value whatsoever unless it has present or prospective earning capacity. But, in fixing gas rates, our State commissions ignore earning capacity altogether. In the view of many commissions, the value of a seasoned public service enterprise, in profitable operation and in the highest practicable state of efficiency and repair, is merely the present cost of physical reproduction. Furthermore, under the guise of "depreciation," they usually deduct one-third from their estimate of the cost of physical reproduction, *because the property is second-hand*. Then they fix a selling price for gas which allows the gas company to earn (if it can) 6% upon their estimated cost of reproduction, less this depreciation.

The Constitution of the United States prohibits the confiscation of private property, and the Supreme Court has decided that compulsory gas rates that will not earn 6% upon the actual value of a gas undertaking are *confiscation*. But Constitutional defense of the right to possess private property, by decreeing that a return of less than 6% is confiscation of a gas owner's property, is vastly different from suggesting that to earn above 6% is confiscation of the gas consumer's money. Nevertheless, some of our commissions act as if the Constitution, in prohibiting a lower rate of return than 6% as confiscatory, also forbids a higher rate than 6% as unjust and unreasonable; and, at great labor and expense, they fix gas rates that will earn the *minimum* Constitutional return upon the reduced value of gas undertakings, estimated as above described. Just and reasonable rate regulation, in their view, means reducing the rates exactly to the point of confiscation.

This procedure is unjust to both gas owner and gas consumer, whose interests, broadly speaking, are identical. If it continues, the loss to the gas consumer will be far more in the aggregate than the loss to the gas owner. For example: This method treats all structures alike, since all alike have reproduction value. Whether installed wisely or foolishly, whether techical failures or unique examples of advanced efficiency, whether obsolescent, inadequate or redundant—all construction is grist alike for their mill, provided the physical condition be the same. With this method in vogue, no gas company can afford to scrap inefficient buildings and plant, for these have reproduction values perhaps as great as the new building and plant that would take their place; so the consumer must continue to pay the price of inefficiency, inasmuch as any money the gas company might invest in reducting the cost of gas under such circumstances would be wholly confiscated. The resulting paralysis of technical and financial effort and initiative will inevitably bring the gas business into a condition of decadence, and the consumer will bear the brunt of the loss.

Gas manufacture is a rapidly changing art. It is possible to find gas works, whose cost of structural reproduction per unit of output is double that of gas works where the cost of manufacture is less. The former may be the result of successive additions on conservative lines; whereas the latter would be the product of advanced technical genius, supported by a far-sighted policy of scrapping existing plant whenever the net efficiency could be increased. The capital expenditure in the latter case might easily be the greater of the two; yet, after adequate annual payment upon this capital and for amortization of the scrapped plant, the consumer profits by a cheaper supply of gas. Manifestly, the interests of the consumer have been better served in the latter case; but, with gas rates based solely upon the cost of structural reproduction, the company whose enlightened administration has benefited, not only its own, but all other gas consumers, is penalized for its progressiveness by the confiscation of one-third of its earnings. Who, then, will go and do likewise?

Suppose we accept the present cost of structural reproduction as the only value of gas processes, plants, and businesses which have been laboriously developed through a century of persistent effort: The further deduction of say one-third for "depreciation"—because the undertaking is not a new enterprise, but, on the contrary, has thoroughly demonstrated its permanent value as a going concern—is strangely indefensible. A brand new and finished gas undertaking, with its works, holders, distributing system, meters and stoves, is a practical impossibility; and who, in his senses, would invest one dollar in any new enterprise where the maximum return is limited to 6%, and one-third of his investment is confiscated by the time it attains its full value as a going concern.

Gas is a service which must, of necessity, develop with the growth of the municipality. Some of the plant must be new and some of it old, just as some parts of the city are new and some old. All that interests the gas consumer, is that the whole plant be efficiently maintained in condition to render him proper service at a reasonable rate. In this respect, a tried and seasoned gas undertaking, with all of the inevitable faults of new design and construction finally perfected, and with all of its employees and administrators highly trained and organized, is far better than a brand new undertaking.

Fair Play Essential.

We are familiar with the miraculous growth in usefulness of the gas industry during the past century, in the absence of rate-controlling commissions. Can we look forward to corresponding development in the future? Or have we now to fear that excess of zeal or politics in rate-making will throttle the adaptability and restrict the potential usefulness of this rapidly changing industry? The gas industry seeks no favors; but FAIR PLAY is essential to its usefulness!

And far greater issues than the future of the gas industry rest upon the principle of fair play. The success or failure of all democratic institutions rests upon fair play; upon whether universal suffrage will continue to observe the rights of a more prosperous minority.

Among the worst enemies of democracy are the demogogues who, in defiance of fair play, would place the reins of government in the hands of the many, and the cost of government upon the shoulders of the few. The many to spend, and the few to pay! Incidently, and apart from the political dangers of such injustice, this is a condition that insures maximum waste in public expenditure; it is both the father and the mother of "Pork."

Direct U. S. tax is now paid by 500,000 people, including women and children; the 99,500,000 people who imposed this tax exempted themselves altogether. Ninety-nine and one-half per cent of the people spend this money, which one-half of one per cent. must provide. This is practically taxation without representation—which was formerly unpopular with the American people. The framers of our Constitution foresaw the dangers of such tyranny, and avoided it by prohibiting direct taxation.

There is no inherent objection to an income tax. On the contrary, it should be one of the most equitable and convenient methods of gathering money for the public needs. But our Constitution was created by far-sighted statesmen, who understood human nature, and could profit by the experiences which deprived England of our Colonies and produced our Nation.

We have changed the constitution; we must now prove that the fears of its framers were ill-founded. We must prove that the American people are capable of "toting fair" in the imposition of direct taxes, "everyone doing his bit" And the time to settle this question is now, when large increase in Income Tax is imminent in the interest of preparedness.

Co-Partnership Instead of Unionism.

We have made monopoly illegal upon the part of the employer, although he can never attain more than partial monopoly of a single industry, and experience is beginning to indicate that recent dissolution of such monopolies have proved more to the interest of less competent competitors than of consumers. Moreover, the capital invested by the employer is always a hostage, in the hands of the law and the people, for his reasonable conduct. Hence, despite political hues and cries—there was never any deep-seated danger to the Nation from industrial monopoly.

But *any* monopoly possible to the employer is as nothing, compared with the objective of organized labor. Organized labor seeks to control every industry all transportation, and, consequently, community life, by monopolizing the right to say who shall work, when they shall work, how they shall work, with whom they shall work, and for whom they shall work. Free labor is anathema to organized labor. In suppressing this constitutional right of freedom to work, lawless means are openly used to supplement and strengthen intimidation. Organized labor is above the Constitution; it employs a policy of frightfulness.

By this complete control of labor, of every kind and condition, organized labor plans to paralyze at will any trade, industry or system of transportation—or, by sympathetic strikes, all of them—until its demands are satisfied. Can you conceive of a greater monopoly, or of vaster powers for restraint of trade? Yet, our laws regarding monopoly and restraint of trade apply only to employers, while organized labor is exempted from their operation! It now demands further legal exemption, including freedom from Federal injunction and the unrestricted right to strike and boycot;

and in this lobby it is actively supported by the Chairman of the late Federal Industrial Relations Commission.

I spoke of this labor problem as bearing upon Preparedness; to learn how vitally, we have only to consider the attitude of British organized labor during the present war.

We have seen the fate of the Allies trembling in the balance, and countless noble lives sacrificed, while organized labor fooled the Nation in its extremity.

We have heard the British Government plead for the removal of restrictions upon the output of munitions, and for permission to dilute organized labor with free labor, so that new Government arsenals might be utilized, which, although completed and equipped, were useless because of insufficient organized labor. To obtain the most limited concessions the government had to guarantee that all restrictions would be reimposed after the war.

At a time when the liberty of a nation is at stake, and its best and bravest dying in foreign lands for workmen safe at home, the representatives of organized labor impose their terms upon the representatives of the people. Which shall we call the Government and which the governed?

"Government of the People, by the People, and for the People," is a beautiful consumation, greatly to be desired; but do the people, as a people, ever govern themselves? Or is pure democracy an abstract conception, that never exists in fact?

We condemn autocratic government because it is controlled by a "ruling class;" but is democratic government more free from the rule of special interests?" Is not this the real difference? Autocratic governments are administered continuously by the same class, which, with all its evil, has tradition behind it and is trained especially for its task; whereas, in democratic governments, the control shifts from one organization or interest to another. Are we now leaving the rule of the political boss for the rule of the strike committee? Scarcely that, for Democracy and the methods and objective of organized labor are irreconcilable — as irreconcilable as freedom and tyranny.

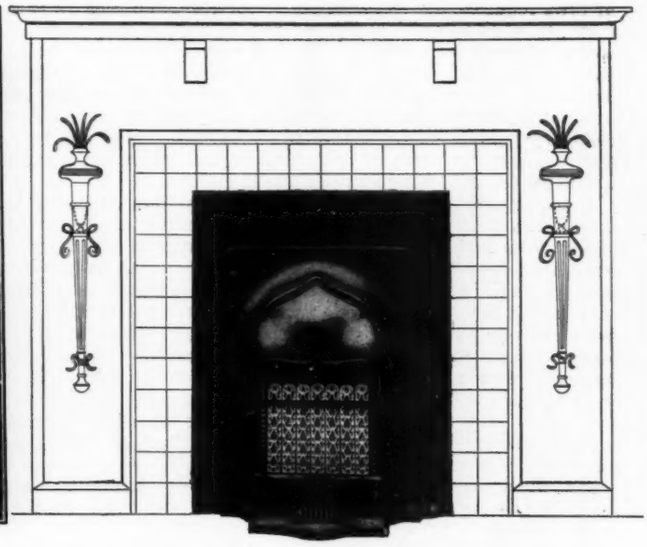
You will, I trust have observed that my other criticisms have carried their own suggestions of remedy; and I do not propose to condemn the attitude of organized labor, without indicating substitute methods that are efficiently relieving the existing evils. We need not think the less of these methods because they are opposed by demagogues whose power and livelihood depend upon antagonism between capital and labor.

There is no basic reason for antogonism between capital and labor, between employer and employed. On the contrary, it is obvious that their interests are identical, since each is essential to the other for the accomplishment of the ends jointly desired. It is, therefore, our plain duty to cure the present artificial differences; and there are remedial methods neither experimental nor difficult. Since co-operation is essential between employer and employed, co-partnership is the simple and direct solution. Co-partnership in profit-sharing; supplemented where practicable by co-ownership, through the investment of the employee's share of the profits (over and above his regular wages) in the business for which he works.

It is fitting that I should advance this principle upon the present occasion, because modern co-partnership of this nature was originated in the South Metropolitan Gas Works by the late Sir George Livesay in the eighties of the past century, after he had won the most crucial strike that ever occurred in the gas industry. Co-partnership has since been adopted by that other commanding personality, the late Sir Corbet Woodall, Governor of the London Gas Light and Coke Company; and by many others. In the gas industry, this principle has established *practical identity of interest between the individual employer and his own workmen;* why not in other industries? If the nature of any industry makes co-partnership impracticable, the "task and bonus" system will go a good way towards this same consummation.

It would not seem a formidable task for Government to initiate a voluntary movement which would exploit these beneficient principles throughout the industrial life of the Nation, rather than waste opportunity and excite class controversy by such appointments as the late Industrial Relations Commission; of which the best thing to be said is that the Country had sufficient sense of humor to take its activities as a joke!

Radiant Gas Fires in Toronto, Ontario.



Dining Room, at 34 Huntley street, Toronto.

The Consumers Gas Company, of Toronto, Ont., have been most successful in introducing the radiant type gas fires, as shown in the accompanying cuts.

In a recent booklet on the subject, stress is laid on the value of radiant heat.

"There are two distinct forms of heat—radiated and convected. Convection is the warming of the air by contact with a warm body. Radiation is the warming of the walls, floors and objects in the room, by the direct issue of heat rays from the source of heat.

"Radiant heat does not noticeably warm the air, but passes through it, warming any material surfaces which intercept the rays. These surfaces gradually warm the air by convection. Radiant heat gradually warms the air to a comfortable degree, by convection, through its contact with the walls and objects in the room, provided there is adequate ventilation."

The heaters are equipped with a multiple bunsen burner, and above each nozzle is a vertical lattice of refractory material, back of which is a block of fire brick. All of the heaters are flue connected.

Both heat and light radiations are given out by these heaters, and they correspond more closely to a coal grate in appearance and effect than any other gas operated heater.

Theory of Public Utility Franchises.

By George McLean.

The "Theory of Public Utility Franchises," the true, just, practicable and safe theory, is mutuality.

Reciprocity and mutuality are identical. Reciprocity is the basis of order and justice in all things, physical, spiritual and commercial. It is that principle which accomplishes order in the physical universe, through the balancing of forces and justice in the domain of morals through the balancing of considerations. Reciprocity is automatic morality. It is the mathematical expression of justice. Pythagoras felt this, when, observing the order in the universe, and realizing its source, the Grecian philosopher exclaimed: "God rules the world by mathematics." Confucius, also, appreciated the universality of this principle, and when asked to express in one word the sum of his philosophy, he responded: "Is not 'Reciprocity' that word?"

In our business "Reciprocity is the hand-maiden of protection." Implying a balancing of forces, it means that contributions received from the communities we serve must be balanced by the benefits we confer on the comunities. It means that, for every right we may fairly claim, we have a compensating duty, upon the vigilant, capable, faithful and unpartial discharge of which we should rest our expectations of justice.

Mutuality should govern the conditions of all public service franchises, for the further reason that whosoever operates a public utility under authority of a charter stands in the shoes of the municipality which has elected not to perform the service directly. If this fact were duly and constantly regarded by both parties to the negotiations, there would be no franchise question. The many questions which now arise in the course of ordinary negotiations, preceding the granting of a franchise, have their origin in distrust, which could not exist if the candidate for the franchise proposed merely to make the investment on behalf of the city at a fixed rate of interest to be guaranted by the city.

Limiting Franchises.

If this were the argument, nobody would propose on grounds of public policy, to limit the franchise to 25 years, as the present law of Iowa requires, nor to assess public service companies by special methods, so as to make certain of taxing when in their possession a class of assets commonly not assessed when in the hands of others having no better claim to exemption. Nobody in the legislature, or the city council, would propose for public service companies burdens or restrictions not imposed on public utilities operated directly by the city, nor question the reasonableness of regulations and requirements accepted without question when put forth by municipal departments operating public utilities.

If the returns of the public service company were limited by law or contract to a fixed and guaranted rate on the investment, any excess going into the public treasury, all could understand that the exactions imposed upon it should be such only as would be considered wise and just if the property were operated by the city directly, and that the burden of all further exactions and restrictions must ultimately fall upon the patrons of the service in the form of higher charges than would otherwise be necessary. When these burdens are such as to arouse the apprehension of investors in the securities of the company, the effect is equivalent to an advance in the cost of raw materials. For among the materials the public service company uses in its business, capital is chief. The terms upon which the company can secure this capital depend upon its credit, which may be impaired by legislation, or even by threat of legislation, of no compensating value, nor of any value whatever, to its patrons.

It is not feasible for the municipality to guarantee the public service company a fixed return on its investments, as, even if there were no legal obstacles in the way, this would destroy the company's motive for the exercise of those virtues upon which private ownership of any class of property depends for its justification. Nor does mutuality require that the contract guarantee a fixed return. What it demands on the one hand is that the public authorities prescribe for the government of the company only such regulations, burdens and restrictions as an enlightened government would impose if the utility were administered by the municipality directly. The contract lacks mutuality, and hence justice, unless the public authority, for each burden or restriction it imposes, recognizes a balancing obligation of its own.

Thus the law limiting franchises to 25 years is unsocial, inequitable nd lacking in mutuality because it does not provide for amortization of the investment within the company's corporate life. The company, on the one hand, is allowed no charge for depreciation not based on the physical life of the property devoted to the public service, which may be 75 years, and yet, on the other is not guaranteed that it will be allowed to operate for more than one-third of this period. Mutuality requires correspondence between the franchise and amortization periods.

This restriction upon the life of franchises originated in the experimental years of regulation and under conditions which no longer exist. The existing law of Iowa provides that the right of the city council to regulate rates and service shall not be abridged by contract. It therefore withdraws all semblance of mutuality and justification from the law limiting the life of the franchise to a minor fraction of the amortization period. For the city council's continuous and inalienable right of regulation renders it impossible for a corrupt or incapable council to deprive its successors of the power to impose on the public service company any regulation respecting rates of service which justice may require. The present law limiting the period of the franchise is contrary to public policy because, while serving no necessary or useful public purpose, it is damaging to the credit of the company serving the public. This credit is as indispensable as the coal, transportation or other raw materials of the industry, the price of which must influence the cost of the service to the consumer.

The plea that the company enjoys a special privilege and therefore should bear a special burden is unsound. For the intent of the law is that the privilege, special or otherwise, shall be granted only that the public may be benefited and not that it may be burdened and therefore entitled through its agents to exercise a reprisal or reciprocal burden whereby it may be compensated for the injury. If the company renders inferior service, or exacts excessive profit, the true policy is to require service, or proper moderation of profit, and not to sanction the continuation of injustice to its patrons on condition that the company assume a special burden.

Multiple Regulation.

Furthermore, as too much legislation in the constitution of a State, or the platform of a political party, often proves embarrassing to those who had thought to profit by it, vexatious to the people and obstructive of their just aspirations and rational demands; so the multiplication of restrictions and exactions in a franchise frequently results to the disadvantage of all concerned. This multiplication is most likely to be evidenced when those representing the city in the negotiations lack experience.

The model franchise, like the ideal constitution, contains few specifications and seeks to preserve the rights of the people through powers reserved rather than through legislation detailed. The aim of the regulations expressed is to establish and maintain mutuality in the relations of the public service company with the city and its patrons. If their severity is such as to impair the credit of the company they must defeat the just purpose of all regulation.

The regulations prescribed by the company itself should fully recognize the requirements of reasonableness and mutuality.

The ordinary franchise prescribes a maximum rate which the company is free to reduce on its own motion and without awaiting the action of the public authorities. This liberty has been freely exercised. In many instances rates have been reduced voluntarily, not upon warrant of increased volume of business, but merely upon expectation that this result would follow. Dividends have been voluntarily sacrificed for a period in the hope thereby of obtaining better assurance of continued dividends in later years. Under this plan, the essence or object of mutuality is attained whenever the profit is neither excessive nor deficient, but reasonable.

However, mutuality must be automatic in operation if it is to be reliable and permanent and is to command the confidence of the public. This latter is a consideration of first importance. The public will not consciously legislate against itself, and therefore will not impose unjust burdens, exactions or restrictions upon the public service company, or injure the company's credit, if made to realize clearly that thereby it is injuring itself.

Profit Sharing.

Speaking for myself, and not assuming to express the sentiment of this convention, I favor profit-sharing as a guarantee of mutuality and a means of assuring the company's patrons of their interest in its fair treatment, its economical, efficient and just management, and its prosperity.

This profit-sharing plan contemplates a standard rate and a standard dividend, which dividend is not to be guaranteed by the city, but is to be retained by the company if it succeeds in earning it. This standard dividend should be cumulative, should correspond to the rate the banks of the community charges on loans carrying hazards equal to those borne by the public service company, and should be based on the value of the property devoted by the company to the public service. Further net earnings, if any, should go to a reserve fund until the latter reaches a certain proportion of the capitalization based on the inventory value of the company's property.

The reserve should be used when necessary to maintain the property, or meet a deficit in the standard dividend, and should be available for no other purpose. Any surplus which might he accumulated after meeting the requirements of the reserve or emergency fund should be divided between the company and its patrons on a sliding scale. Any dividend above the standard allowed the company out of this surplus should be proportioned to and dependent upon its rebates to consumers. Thus a particular concession in the rate should give the right to a particular increase in the dividend and a further concession in the rate should authorize a further increase in the dividend.

Under this plan rates would be automatically adjusted to the worth of the service to the consumer. His rebate, or dividend, would rise or fall with the prosperity of the company, and the company's right of participation in the earnings above the standard dividend would be its sufficient motive for endeavoring to operate the property with the utmost economy and to increase the profitable business from year to year. Its success in these particulars would measure not only the consumer's return, but its own.

Such a plan, by establishing between the public service company and its patrons a clear and unmistakable mutuality and identity of interest, should unite them in co-operation to their joint advantage.

It may be, and often has been suggested, that a profit-sharing scheme lacks mutuality unless those who are to share any profits above a standard dividend, should the same be attained, shall also share in bearing the losses should those be experienced. Such objection is more apparent than real; for the standard dividend, which is cumulative, and calculated according to the hazards of the business, is supposed to represent a fair profit which the company is entitled to set apart for itself before undertaking the division with patrons of any surplus earnings it may have the good fortune to acquire. Furthermore, modern demands of competition and public opinion have put into operation in many instances a system of profit-sharing which differs from that here proposed only in the particular that the company's servants and patrons receive not merely a share of the benefits resulting from the progress of the industry, but the entire benefit, the return to capital remaining unaltered. There comes to mind the case of a company whose rate 20 years ago was 100% above its present charges. Meanwhile the cost of all materials and service required in its business has advanced. There has been no increase in capital acconnt, except for cash actually paid in, and no increase in rate of dividend. Had this company formally instituted a profit-sharing plan 20 years ago, it might have been allowed to retain for itself some portion of the benefits of the progress in the industry which were wholly absorbed by its patrons and by those who supplied its materials and service. And if 20 years ago such profit-sharing practices had become universal among industries whose rates are subject to public regulation, can it be doubted that this policy would have had an educational influence upon public opinion or that our patrons would have lent a more credulous and more sympathetic ear to our complaints concerning ill-considered and oppressive legislation?

Excepting the class which condemns all rent, interest and profit in any industry as unjust, may we not safely assume the willingness of the public to concede a reasonable profit to the useful and legitimate industry which may be able to attain it, and its further willingness to concede to the management a fair degree of participation in the benefits of progress in the industry? Profit-sharing is proposed in the belief that such assumption is safe and that it would dispel those misunderstandings and suspicions which often in the past, and frequently to their mutual disadvantage, have disturbed relations between the public service companies and the people.—*Address to Iowa District Gas Association.*

Bureau of Mines Estimates of Cost of Making Gasoline by the Rittman Process.

Using Fuel Oil from which Gasoline had already Been Extracted by Ordinary Process of Refining.

The capacity of a single tube producer was 1.55 bbls. per hour or 37.2 bbls. for 24 hours; and with a loss of 10%, would yield 17% gasoline, the balance being fuel oil as valuable as the original fuel oil.

The estimated cost of a five tube plant is	$15,000
Building to house plant	5,000
Total	$20,000

Monthly capacity would be 5,580 bbls., and deducting 10% for "shut downs" leaves net capacity about 5,000 bbls. The yield of gasoline, 17%, would be 850 bbls., or 35,700 gals.; and residium, 73%, equals 3,650 bbls.

Wtth Fuel Oil at $0.50 per Bbl.

Expense.

5,000 bbls. fuel oil at $0.50 per bbl	$2,500
Labor for one month	560
Fuel (1,050 M ft. natural gas at 15c)	160
Electricity	100
Repairs	100
Interest and depreciation, 6% each	200
Refining cost 20c. per bbl	1,000
	$4,620

Credit.

3,650 bbls residium at 50c. (fuel oil)	1,825
Net cost of 850 bbls. (35,700 gals.) gasoline	$2,795

Cost of gasoline per gal. 7.8c.

With Fuel Oil at $1 per Bbl.

Expense.

5,000 bbls. oil at $1	$5,000
Labor	560
Fuel	160
Electricity	100
Repairs	100
Interest and depreciation, 6% each	200
Refining cost	1,000
Total cost	$7,120

Credit.

3,650 bbls. residium at $1 (fuel oil)	3,650
Net cost of 850 bbls. (35,700 gal.) gasoline	$3,470

Cost of gasoline per gal. 9.74c.

With Fuel Oil at $1.47 per Bbl.

Expense.

5,000 bbls. oil at $1.47	$7,350
Labor	560
Fuel	160
Electricity	100
Repairs	100
Interest and depreciation, 6% each	200
Refining cost	1,000
Total cost	$9,470

Credit.

3,650 bbls. residium at $1.47 (fuel oil)	5,365
Net cost of 850 bbls. (35,700 gal.) gasoline	$4,105

Cost of gasoline per gal. 11.5c.

Selection, Training and Compensation of Industrial Fuel Salesmen.

By G. M. Karshner.

The ideal young man to select for development into an expert industrial salesman, would be one with engineering training, equipped with sound business and factory sense, and at the same time possessed of selling ability.

There is perhaps no combination in one man so hard to find as a combination engineer and salesman. Engineering training, as a general rule, does not go hand in hand with salesmanship training. However, some of the most successful men in this country are good engineers and good salesmen, but they are the exceptions rather than the rule.

Considering this condition, the question arises as to whether it is best to take a graduate technical engineer for industrial gas work, or a salesman who possesses some mechanical ability and enough sound sense to study factory conditions and manufacturing processes and to apply gas to them. Ordinarily, the industrial gas field does not attract a graduate engineer, on account of the remuneration, although some engineers in this country have taken up industrial fuel work in gas companies with the hope that the position will be a stepping stone to higher gas company work.

It seems to me, judging from results so far secured, that a gas company will do better if it selects for this work men who have had a comparatively good education on general lines, and are consequently able to study combustion, construction of appliances and manufacturing processes. The ordinarily intelligent man can acquire from books of various kinds enough engineering knowledge to get him past most of the problems that come up in his work. All gas companies have technical engineers who can be consulted when a particularly difficult problem, requiring technical information, is met. The majority of industrial fuel salesmen to-day are men with little technical training. As in every other field of business, only the *good* men, who desire to advance, have become *good* industrial men. The indifferent men have remained indifferent industrial men.

Selling ability, coupled with intelligence inside of a manufacturing plant seems to work out most of the problems met in the various cities. I do not wish to be understood as saying that technical knowledge is not desirable in an industrial fuel salesman, but I believe that the combination of technical man and salesman is rare, and I would rather take my chances, when I cannot get a combination man, with a well equipped salesman, rather than a straight technical engineer. Where a company is large enough for more than one man, an engineer could be used to assist in the selling of appliances and applications of gas, in an advisory capacity. The small company can use the industrial fuel engineer of the N. C. G. A. for its technical work.

Of late years, we have heard some complaint from gas company managers, that they have hired so-called "industrial fuel engineers" and have not been able to get results. One of the main reasons for this has been that the industrial man hired, although he has been in the business for a few years, has not been equipped with a combination of selling ability and manufacturing sense. If a gas manager finds an industrial salesman who is out of a job, there is some reason for his being idle. The chances are that he has not produced good results in his former position. If the gas manager hires one who is working with another gas company, he runs *two* chances of the man not making good; one that he was not making good previously; the other, that even if he was making good in a particular town, he would encounter, in the change, a great many manufacturing plants with which he has had no experience, and he might not be able to cope with the situation. This is not meant to discourage industrial men working for companies who do not appreciate good business and will not pay a man properly for it. It is simply to call attention to the fact that a gas company manager should look more closely into the hiring of his "industrial fuel salesmen of experience" than of any other class of men that he has occasion to employ.

Industrial gas conditions are different in different cities. I do not refer to prices of gas, calorific value, etc., but to the articles manufactured and actual factory conditions. If the man is not the proper kind of an industrial man, he may not be able to apply experience gained elsewhere, and do the work expected of him by the manager; consequetly the manager blames industrial fuel men in general.

Training.

If the ordinarily intelligent young man has the proper "stuff" in him to become an industrial gas salesman, there is enough material in the N. C. G. A. Handbook and its various publications to enable him to get a good start and a good groundwork in the theory of combustion and industrial gas applications. Any company desiring to train a man along these lines should start him with the written material available now, which, by the way, was not available two years ago.

With this material to study, the main thing remaining for any man to do is to go into factories and ask questions, and gain an understanding, as quickly as possible, of as many of the manufacturing processes as he can possibly come in contact with; each process understood, and each instance of gas application to a manufacturing process which he studies, will help in the next proposition he meets.

The Industrial Engineering Service of the N. C. G. A. can now be used to assist in the development of an industrial department in any company. A few weeks work by a new man under the direction of this service should be worth many times the amount involved. For various reasons, it has paid some gas companies to develop their own industrial men. In fact, most of the industrial men in this country have been trained in the cities in which they are working, and this training has simply been a development of experience limited to the manufacturing industries in their city.

Many companies do not have industrial fuel departments large enough to conduct a regular school, but as was said before, the right kind of a man can school himself with material from the N. C. G. A. and get the practical information by actual work, and by actual work only. There is no other line of business, that I know of, where success depends so much upon the man himself, and upon experience gained in his daily work.

Compensation.

In my opinion, there is one best way for compensating gas companies' salesmen—pay them a commission on the sale of the appliance and a fixed amount for either estimated or actual gas consumption of the appliances sold. There are various ways of determining proper commissions and proper percentage on gas consumption, but a salesman should be paid for both parts of the transaction. He sells an appliance and he sells gas, and should be paid for both.

When the basis of the combination is determed, there should be no maximum limit for a salesman to earn. He should receive all the money as he can properly earn, both on appliances sold and the gas sold. Better men will be encouraged to enter the field; perhaps we may even secure some combination salesmen-engineers, which would be ideal.

With a proper system of paying salesmen, the problem of training will almost take care of itself, as a man with unlimited opporturnities before him will certainly train himself, and the man who does not do it, automatically drops out shortly after the start. It is hard to force a man to train himself to take care of a difficult position, with a low maximum salary that he may aspire to. If he sees opportunity ahead of him, and knows that the more he learns and the more business he can do, the more money he can make, securing training becomes a habit with him, and it is not a question of the spur of the manager.

Our best men advance by their own volition, and not because of incessant force exerted by the manager. Give a good man the right incentive and managerial worry and work is greatly reduced.

—Paper read before the Mid-Year Conference, N. C. G. A.

Radium Never Seen in Nature.—Radium is a metal described as having a white metallic lustre. It has been isolated only once or twice, and few people have seen it. It is ordinarily obtained from its ores in the form of hydrous sulphate, chloride or bromide, and it is in the form of these salts that it is usually used. Ordinarily, radium ore carries only a small fraction of a grain per ton of material.

Experimental Data on Househeating by Artificial Gas.

By W. H. Taylor.

During the winter of 1915–16, two houses have been heated by gas fuel in Omaha, in order to secure comparative data in regard to the cost and requirements of such heating.

The tests were started December 15th, and the data is brought up to the 29th of April, which covers the severe winter weather.

Both houses are of ordinary frame construction, so-called story and a half, each being equipped with storm windows on the north and west exposures.

House "A" is equipped with two Johnson floor furnaces, one in the dining room and one in living room; a Reznor wall heater in bath room and a Reznor No. 5 heater in kitchen. House "B" has two Johnson floor furnaces only.

The outside temperatures during the tests were taken from the weather bureau records, the inside temperatures by recording thermometers with weekly charts. The gas consumption was taken by separate meters, and the hourly gas consumption computed from complaint meter charts.

These installations worked fairly well, but it was soon discovered that they were not of sufficient capacity to bring the house temperatures up quickly enough during severe weather. The manufacturer rates each Johnson floor heater as able to take care of 3,000 cubic feet of house content; our experience is that one unit to each 1,200 to 1,500 cubic feet of content should be installed. This is necessary in order to bring the temperature of the house that has been cooled at night, up to the proper temperature quickly in the morning.

An examination of the weekly temperature charts shows the slow work in building up temperature in severe weather—but also shows the ability to hold the required temperature when once it is attained.

Data and results of the tests are as follows:

	Ave Temp. Outside.	Ave Temp. House "A"	Diff.	Ave. Temp. House "B."	Diff.	Gas Used "A."	Mc. "B."
Half Dec.	28.1	68.1	40.0	67.2	39.1	12.0	10.1
January	17.5	72.3	54.8	68.1	50.6	48.7	31.8
February	24.9	70.7	45.8	68.2	43.3	32.8	18.8
March	43.7	68.9	25.2	70.7	27.0	24.4	18.0
April	49.0	68.7	19.7	68.7	19.7	14.6	10.8

	"A"	"B"
Total days covered	138	138
Ave. 24 hours inside temperature	70.1	68.7
" " outside "	31.3	31.3
" " difference "	36.8	37.4
Total gas consumption	132.5 M	93.6 M
Average per day	.96 M	.68 M
Total cubical contents	7775	5978
Total window exposure	120 sq. ft.	130
Total wall exposure	1063 "	752
Cubic feet gas used per deg. diff. temp. per day per 1,000 cubic feet content	3.36	3.04

Assuming an average house temperature of 68°, and using a factor of 3 cubic feet of gas per day per degree of increase in temperature for each 1,000 cubic feet of house content, we have estimated the consumption as follows:

		Cu. Ft. Gas.
October,	68°–54°=14° x 31 days x 3 cu. ft. factor	1,302
November,	68°–38°=30° x 30 " x 3 " "	2,700
December,	68°–27°=41° x 31 " x 3 " "	3,813
January,	68°–21°=47° x 31 " x 3 " "	4,371
February,	68°–24°=44° x 28 " x 3 " "	3,693
March,	68°–36°=32° x 31 " x 3 " "	2,976
April,	68°–51°=17° x 30 " x 3 " "	1,530
Total		20,388

For 1,000 cubic feet of house content.

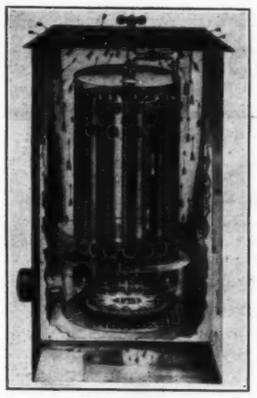
The following table shows the estimated and actual consumption for house "A":

Month.	Act. Diff. in tem.		Days.		Mcf contents		Factor.		Estimated Cons.	Actual Cons.
½ December	40°	x	16	x	7.77	x	3	=	14.9	12.0
January	55°	x	31	x	7.77	x	3	=	38.6	48.7
February	46°	x	29	x	7.77	x	3	=	31.1	32.8
March	25°	x	31	x	7.77	x	3	=	18.1	24.4
April	20°	x	30	x	7.77	x	3	=	14.0	14.6

House "B"

½ December	39°	x	16	x	5.98	x	3	=	11.2	10.1
January	51°	x	31	x	5.98	x	3	=	28.3	31.8
February	43°	x	29	x	5.98	x	3	=	22.2	18.8
March	27°	x	31	x	5.98	x	3	=	15.0	18.0
April	20°	x	30	x	5.98	x	3	=	10.8	10.8

In conclusion, a few comments are given concerning the units used in these tests. The Johnson floor furnaces have flue openings to be connected to chimney. Black flue pipe was used in both cases, and it is evident that if this type of furnace be used, heavy galvanized iron pipe must be substituted, as the condensation of water vapor from the burning gas rusts out the black pipe so that it will not last during the heating season. The selling agent for this furnace says the cold air inlet should be connected to an air duct from outdoors, as greater efficiency could be obtained. In our installation in house "A," which has a coal furnace, we connected the cold air inlet of both gas heaters to the cold air circulating system of the coal furnace. In house "B," we placed floor registers and made the cold air return from these to the gas furnaces. There is no doubt but that a purer air supply would be maintained in the house if the cold air were taken from outdoors, and during cold weather there would be a greatar draft to the furnace, but, from the standpoint of efficiency, it is obvious that the method pursued in our installation is superior. We could see no reason for adopting the outdoor connection, when it is common practice to circulate the air within the house in all hot air furnace installations in Omaha.



Johnson Floor Furnace.

Concerning the use of open flame gas heaters of the Reznor type, without flues, a rather serious objection arises from the water vapor condensation on the windows and other cold surface in the house during severe weather. The condensation is deposited in the form of frost, which not only obstructs the light but, when melted, harms the wood work and painting.—*From paper to the Iowa District Gas Association,*

Accidents That Could Have Been Prevented.

[From reports of Mr. J. B. Douglas.]

An employe while indulging in horseplay dodged to one side, bumped his head against the wall and sustained lacerations of the scalp. There is never any reason for horseplay and it should not be permitted.

A ladder with a rope brace collapsed while employe was standing on it, and he sustained a sprained ankle. This is just another reason for doing away with step-ladders that have not proper bracing.

An employe installing a water heater left a board with protruding nails in it on the floor. The consumer stepped on the board and a nail punctured his foot. The carelessness of the employe in this case is inexcusable.

An employe getting out of back of wagon with meters, by defective fastening of the tailboard was caused to fall to the ground and suffer several serious bruises. All that was necessary in this instance to prevent an accident was inspection.

A employe failed to make test after installing meter and an explosion resulted, causing serious property damage. The preventative for an accident of this kind is clear to everybody.

AMERICAN
GAS LIGHT JOURNAL

SANFORD K. CAMPBELL, Editor.

Published Weekly by
AMERICAN GAS LIGHT JOURNAL, INC.
42 Pine Street, New York, N. Y.

ELBERT P. CALLENDER, President.
STANTON G. KRAKE, Vice-President.
FREDERICK A. SOUTHWORTH, Treasurer.
CHARLES H. WADELTON, Secretary and Manager.

Subscription, $3.00 per year, including postage in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines.
In Canada, $4.00. Foreign, $5.00.

Entered at the Post Office, New York City, as Second-Class Matter.

CONTENTS.

GAS AND OTHER THINGS.—A PLEA FOR FAIR PLAY IN BUSINESS, Arthur Graham Glasgow..... 401
RADIANT GAS FIRES IN TORONTO, ONTARIO..... 403
THEORY OF PUBLIC UTILITY FRANCHISES, by George McLean..... 404
BUREAU OF MINES ESTIMATES OF COST OF MAKING GASOLINE BY THE RITTMAN PROCESS..... 405
SELECTION, TRAINING AND COMPENSATION OF INDUSTRIAL FUEL SALESMEN, by G. M. Karshner..... 406
EXPERIMENTAL DATA ON HOUSEHEATING BY ARTIFICIAL GAS, by W. H. Taylor..... 407
ACCIDENTS THAT COULD HAVE BEEN PREVENTED, by J. B. Douglas..... 407
EDITORIALS..... 408
Baltimore's Benefit Plan—Society of Gas Engineering.
AMERICA'S GAS CENTENARY FITTINGLY CELEBRATED..... 409
ELECTRIC DRIVE FOR EXHAUSTERS..... 411
COKE CONCRETE FOUND STRONG AFTER SEVEN YEARS.... 413
ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 414
Another Set at North Adams—Deposit is Security—Baking to Help—Oxygen Generators—Against Misleading Ads.—Newport Rate—Florida Utilities Corporation—Alton Street Lighting—Holder for Spencer—Kansas City Deals—Continuous Reading—Hooking-up Illinois—St. Petersburg Plant—A Delaware Charter—Sausalito Franchise—Wyandotte Offers—Portland Extensions—New Massachusetts Company—Can't Afford It—New Terre Haute Rates—Only Belleville—The Speakers—Portrait of Col. Dickey—And Other Personals.
Financial Notes..... 416
MID-YEAR CONFERENCE EDUCATIONAL PAPERS (Advertising Section)..... 18
Meeting Times of the Various Gas Associations (Advertising Section)..... 21
Public Lighting Table for July, 1916 (Ad. Section)..... 26

Baltimore's Benefit Plan.

During the American Gas Centenary Celebration, in Baltimore, the Consolidated Gas, Electric Light and Power Company announced a new Sickness and Death Benefit plan, and awarded service badges to 840 employees who had been with the company for 5 or more years.

A meeting was held on Friday afternoon, June 16, at Lehman's Hall, Baltimore; only those with service records, and a few invited guests being present. Probably the most popular man in the organization, Mr. Geo. Beadenkopf, Chief Engineer of the Gas Department, who has seen 35 years of service with the company and its predecessors, presided over the meeting.

The badges awarded were of gold, with a different design for each 5 year period of service, and were presented to each "Fellow Worker" by Mr. J. E. Aldred, Chairman of the Board. The number of badges presented, according to years of service, were as follows:

For 50 years.....	5	For 25 years.....	24
" 45 years	3	" 20 years.....	37
" 40 years	8	" 15 years.....	63
" 35 years.....	18	" 10 years.....	247
" 30 years.....	30	" 5 years.....	405

President H. A. Wagner announced the details of the sick benefit plan as follows: The company will bear all the expense of the plan. In case of sickness of any kind, half pay will be given for not more than 9 weeks, to employees of over 6 months, who are paid by the week, semi-monthly or monthly; and after one year's employment to those paid by the hour. After 3 years employment three-quarters pay will be given for not more than 18 weeks. After 5 years employment, full pay will be allowed for not more than 6 months.

The death benefit feature provides that $100 will be paid the families of those who die after one year's service; $200 after 2 years, and $500 after 5 years service.

As service pensions have been in force at Baltimore for a long time, this new plan is just one more step toward co-partnership.

Society of Gas Engineering.

On Thursday last the Society of Gas Engineering of New York City held its eleventh annual meeting in the auditorium of the Consolidated Gas Company, 130 East 15th Street, New York City.

The report of the Secretary reviewed the activities of the year, covering eight regular meetings, at which important papers were presented by the members and interesting lectures delivered by representatives of prominent manufacturers of materials largely employed in the production of gas. At the meetings there was an average attendance for the year of 71 members, representing all of the gas companies in the borough of Manhattan and their subsidiaries.

The events of the year of primary importance in the society's work were its participation in the proceedings of the International Gas Congress in San Francisco in September, 1915, and its Supper Dance at the Hotel Biltmore in May.

The officers elected to serve for 1916-1917 are as follows:

Geo. E. Woods, President; W. Cullen Morris, Vice-President; A. F. Macklin, Secretary; Gilbert Francklyn, Treasurer.

Executive Committee.

R. A. Carter, Jr., Chairman, John Stilwell, C. S. Fox.

Following the meeting the members adjourned to the Consolidated Gas Company's dining room for dinner, during the progress of which an exceptional entertainment was presented.

Solos were rendered by Messrs. Harry T. Burleigh, J. Irwin Mutch, John W. Price, A. W. Stark, W. L. MacIntosh and H. H. Himsworth; and these with Messrs. R. M. Kellogg and Thomas Scofield made up a double quartette.

This meeting, which was attended by about 100 members, marks the close of a most successful year.

America's Gas Centenary Fittingly Celebrated.

Baltimore Makes a Unique Record.

One hundred years young, rather than 100 years old, was the spirit of the Gas Centenary Celebration, held in Baltimore June 16 and 17, where the first gas company was established.

Baltimore, the "City of First Things," can boast of being the birthplace of the "Star Spangled Banner," the first umbrella, the first gas company and the first gas meter. The building in which gas was successfully demonstrated, leading up to the formation of the first gas company, is still standing, in a fine state of preservation.

The handsome bronze tablet, presented by the Consolidated Gas, Electric Light and Power Company, was unveiled at this building, Peales Museum,[1] exactly 100 years, to a day, from the date of the first gas franchise, and there is a movement on foot to have the city turn the building into a museum, and if this is not done, the gas fraternity could well afford to buy it and use it for historical purposes, confining them to gas subjects.

Tablet Commemorating The American Gas Centenary.

Another event, not having strictly to do with the celebration, was the awarding of service badges to 840 employees who had served the Baltimore company for 5 years or more. These men represent one-third of the total nomber of workers in a rapidly growing organization, indicating loyalty of men and appreciation of employer. The spirit of enthusiasm of the former, however, could only be understood by personal contact with the rank and file.

The student and the historian will find a veritable mine of information in the papers read at the meeting, held Friday evening, under the auspices of the Johns Hopkins University, and in the centenary issue of the monthly publication of the local company, known as the "Baltimore Gas and Electric News." The latter marks a new era in public utility souvenir publications, and will be appreciated by the outsider, as well as those within the industry.

The people of Baltimore seem to have taken a much greater interest in the event than did the Gas Fraternity of other cities. The local papers contained column after column of news of the 100-year old event; announcements were made in the public schools and other places, and the parade was witnessed by a goodly part of Baltimore's 600,000 population.

Exercises at the University.

The formal exercises were under the auspices of Johns Hopkins' University at McCoy Hall, on Friday evening, June 16th, the only event held according to the original schedule—because of the vagaries of the weather.

Its president, Frank J. Goodnow, presided at the meeting, paying a fitting tribute to the importance of the Industry.

The first speaker, Mr. Jansen Haines, president of the National Commercial Gas Association, took up the features of the business in which his organization is interested. He made some of his hearers gasp when he stated that the commercial departments had not been organized until the product was found to be satisfactory!

Mr. J. E. Aldred, financier banker and promoter, was the second speaker, and he recounted his early experiences in the gas business. The first company he had anything to do with showed a leakage of 35%, which was cut down by his efforts. He stated that he has been stopping "leakage" ever since. Another gasp came on his statement that engineers were not practical enough to provide reports of value. Out of some 500 reports on Hydro-electric Development, not a single one had been unfavorable. He did say, however, that the gas business was a fine example of the co-ordination of science and sense.

Mr. Walton Clark, representing the Franklin Institute, of which he has been the president for some time, delivered an historical address that outshine's any similar efforts of recent years.

We are prone to accept the outgivings of men holding such prominent positions in the Industry as matters of little moment, as it is generally taken for granted that something of value will be forthcoming, but few think of the research necessary for these efforts.

Mr. Clark covered the pioneer efforts of Murdock, Le Bon, De Motay, Lowe, Bunsen and von Welsbach, each receiving the tribute their work commands. The growth from zero up to an investment of $1,100,000,000, doing an annual business of $190,000,000 with some 32,000,000 people, is a wonderful achievement even in 100 years. Mr. Clark estimates that about one-third of the total sales is used for lighting. An interesting chart was shown giving the quantity of light used by the average household 100 years ago and its cost. It appears that the annual outlay of $20 for lighting is about the same now as then, but with an enormous increase in the illumination furnished.

The first half of the program was completed by an address by Mr. L. H. Baekeland, past president of the Electro-Chemical Society and winner of the Perkins medal, describing the relation of chemistry to the gas industries. It is to be noted that each succeeding speaker brought a wider range of interest and application. Explosives, dye-making, and a greater variety of by-products were the principal features, following Mr. Baekeland's interesting historical introduction. He predicted that with the assistance of a more equitable and higher tariff, all of our coal tar would be worked into products of greater value. City gas, however, will be deprived of a greater proportion of its illuminating constituents each year.

The concluding address, by Arthur Graham Glasgow, reproduced in other columns, gives an international viewpoint, but the author's

1. See American Gas Light Journal, June 12, p. 370

long European residence has not obliterated his Southern accent nor suppressed his Americanism.

The audience had a treat not on the program in the answers each succeeding speaker made to the remarks by Mr. Aldred, quoted above.

Mr. Clark said that Mr. Aldred evidently had not chosen engineers as wisely as he had other counsellors. Mr. Baekeland remarked that if it had not been for the engineers and the chemists Mr. Aldred would now be the president of the Consolidated Tallow Candle Company, and the people would still be groping about in the dark. Mr. Glasgow stated ironically that he had been unable to keep pace with contemporary engineers and that he found it necessary to use "low cunning" to make a little money.

Among the gas men noted in attendance were:

C. H. Nettleton,	New Haven, Conn.
A. E. Forstall,	New York City, N. Y.
A. S. Miller,	" "
F. A. Cressey,	San Francisco, Cal.
E. L. Rieha,	Baltimore, Md.
E. S. Dickey,	" "
Howard Bruce,	" "
Geo. G. Ramsdell,	New York, N. Y.
C. E. Reinicker,	Washington, D. C.
F. P. Duggan,	Lewistown, Pa.
F. G. Corbus,	Gloucester, N. J.
C. W. Wardell,	" "
F. M. Tait,	New York City, N. Y.
J. B. Klumpp,	Philadelphia, Pa.
S. H. Brown,	Columbia, S. C.

The gift was accepted by the Mayor's Secretary, Robert E. Lee, who stated that he hoped the city would make suitable arrangementr to turn the building into a museum.

The Parade.

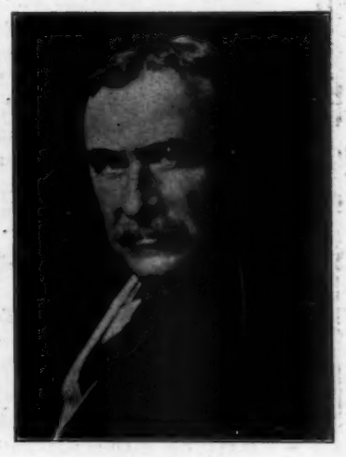
The excitement, acoutrement and music of a circus turnout, civic pride and local interest in an industrial procession, and the beauty of a four-mile long pageant, all rolled into one, was Baltimore's means of doing honor to the gas business and to itself.

In less than five weeks' time Mr. Herbert K. Dodson, manager of Sales of the Consolidated Gas, Electric Light and Power Company, created the plan, designed the 50 odd floats, had them built, ordered 18 types of uniforms for some 2,000 marchers, and had everything ready to start hours ahead of schedule time. An organization that can do this successfully, and carry on their own work, can accomplish any reasonable result demanded in our business life.

Not to be outdone by Rhadames Trumpters, the approach of the head of the column was heralded by an immense Liberty Bell. Then came police escort, Grand Marshall H. K. Dodson and his aids, C. E. Swearer, C. P. Crane, A. B. Evans and W. A. Zimmerman.

A beautifully modelled group of female figures, supporting a globe, was the first of the floats; followed by an automobile, with the following officers: J. E. Aldred, H. A. Wagner, C. M. Cohn, C. E. F. Clarke, J. L. Bailey and Wm. Schmidt, Jr. Another carried Directors Howard Bruce, C. H. Dickey, F. M. Tait and C. T. Crane. The company's retired employees filled the remaining cars in this section.

Gas Men of the Consolidated Gas, Electric Light and Power Company.



George Beadenkopf,
Chief Engineer.

Charles M. Cohn,
Vice-President.

Herbert K. Dodson,
Supt. New Business Department.

Unveiling the Tablet.

When little, 8-year old, Angelica Peale Inglehart, great great grand-daughter of Rembrandt Peale, pulled the cord that drew aside the American Flag covering the centenary tablet, the birthplace of our industry was fittingly identified and the successful period appreciably commemorated.

Peale's Museum, on Holliday street, the front of which is now adorned with the tablet, stands as a monument to the genius of America's early artist, as Rembrandt Peale was one of the few painters who had George Washington as a sitter.

Promptly at 11 o'clock Saturday morning, Dr. A. B. Bibbins, of the local school board, opened the exercises, recounting briefly the history of Baltimore with relation to its gas business.

The museum was the City Hall for a number of years, and is still owned by the city, and Dr. Bibbins made the suggestion that it be turned into an historical museum.

He then introduced Mr. Matthew P. Andrews, one of the city's best known historians, whose subject was the life and work of Rembrandt Peale, which he illustrated with a number of reproductions of the artist's work, notably one of Washington.

Following the unveiling, Mr. Charles M. Cohn made the formal presentation speech, which charmed the gathering, as might be expected from the one man in the gas fraternity of whom can be said, "He has no superior as to eloquence."

The Second Division, under B. A. Duvall, aided by Thomson King, R. H. Spring, L. M. Sherwood and D. M. Mordecai, was headed by the float of the American Gas Institute, being a reproduction of the Institute badge. Among the relics shown were an old cast iron retort and a cast iron pipe over 80 years old. A 15-foot, 2-lift holder received much applause, as did a complete gas engine compressor outfit in working order. These, however, were overshadowed by the ovation given Chief Beadenkopf.

The Horn of Plenty and a Southern Venus was the leading attraction of the third division, headed by H. S. Barrett and Messrs. W. B. Matthews, H. B. Robmeyer, L. L. Heyden and H. L. Teawalt. The Training School for Employees, with Instructor L. W. Herbst and his school in session, was very realistic.

The fourth division, headed by A. S. Loizeaux, J. T. Kelly, G. S. Colburn, L. Birckhead and P. K. Glover, completed the line-up. Some of the floats were the Evolution of Water Heating, Domestic Economy, Reading the Meter, and that of the National Commercial Cas Association.

Band after band, playing zipping tunes, the brilliant yellow of the several hundred autos, wagons, tool carts, etc., the yellow and black decorations, the uniforms of various hues and texture, the living models on the floats, and the pretty girls in autos, all under a brilliant summer sun, made the spectacle one of enjoyment and inspiration.

Electric Drive for Exhausters.

Mr. H. C. Widlake, in the "Journal of Gas Lighting" (London) has an article on the operation of exhausting plant by electric motors, from which we take the following:

The exhauster has been aptly described as the "heart of a gas undertaking," and engineers as a whole have been reluctant to place so vital a unit of their plant under the charge of a power that leaves (at first sight) much to be desired in connection with this particular function.

It is generally recognized that economy and efficiency in working lie in the abolition of separate isolated power generating plants about a works, and the production of all the power required in a centrally situated station from which transmission lines radiate, and the conversion of the electrical into mechanical energy at these points.

Modern gas works, with their many scattered power-using machines, offer an ideal subject for the practical demonstration of this theory; but the interests cannot be served by the haphazard placing of electric motors all over the place irrespective of conditions of working, situation, load factor, and intermittency of operation.

The right time for the consideration of the question of driving the exhausters by electric motors, is when the question of the electrification of the entire works power plant is before the engineer; but when the question crops up at a later date, probably because there is an electrical generating plant on the works, it may be discovered that a plant good enough for stoking, and coal and coke handling machinery cannot be entrusted with the duty of driving the exhausters.

The following factors should be taken into consideration in connection with any proposal to apply electrical drive to exhausting plant:

A.—The condition, type, and general arrangement of the generating plant from which it is proposed to draw the electrical energy.

B.—The nature of the supervision under which this plant operates.

C.—The reliability of the motor as compared with the steam or gas engine which it is proposed to abolish.

D.—The economy gained by such an alteration.

It is proposed to deal with these factors separately.

Type and General Arrangement of Generating Plant.

In the first place, it is essential that the generating plant consist of modern engines and dynamos, and be maintained in first-class condition. Sufficient plant should be provided to have one set always kept as a stand-by (whether an accumulator battery is installed or not) and ready to take the load at a couple of minutes' notice.

As regards the type of prime mover, the gas engine has attained a high degree of reliability, and the writer strongly advocated the use of gas engines for driving the works power generators, on grounds of reliability, economy, low attendance charges, simplicity, and last, but not least, general policy. The use of gas engines for this purpose is a strong weapon against electrical competition with power consumers on the district of supply.

The load on gas works electric plant is a varying one, and is liable to cause considerable fluctuations in the bus-bar pressure unless the generators are of a type which can automatically maintain an even bus-bar pressure over all conditions of load. The shunt wound machine is unsuitable for this work, and fully compounded generators should be installed. These machines will maintain even bus-bar pressure irrespective of load variations, without the necessity of hand regulation or altering the positions of the brush rockers.

This even bus-bar pressure is essential for exhausters; and while it can be accomplished by the use of a suitable type of generator, a battery of accumulators is a valuable asset, and will enable the plant to operate at a much more economical load factor.

Use of Accumulators.

A set of accumulators can largely contribute to low maintenance and running cost on any "D. C." power plant, and is particularly valuable with motor-driven exhausters, on account of the steadying effect upon the bus-bar pressure, which is apt to vary considerably with the fluctuations in the power-load, even with compound wound generators. The battery, connected up in parallel with the main generators—automatically responds to all load variations, discharging to the line at times of heavy demand, and drawing charging current at times of light load when the pressure tends to rise, and thus providing a steady load at a time when the machines would otherwise be running light, and consequently operating at a poor load factor.

The battery also permits main machines to be shut down at intervals of light load, during which it would otherwise be necessary to keep a comparatively large set running on an uneconomical load. Generally speaking, its employment has a steadying effect on the entire plant. It exercises a valuable cushioning effect in respect to the load variations, while it permits the running machinery being shut down, not only during periods of light loads but for adjustments and attentions.

This argument does not, of course, apply to installations having a large reserve of stand-by plant; but on works having (say) three generating sets, of which two are generally kept running, it is a factor which must have quite an appreciable psychological influence upon the engineer in charge of the plant. When any repair is being carried out on the third set, the men so engaged are always handicapped by the disturbing conviction that the machine upon which they are working may be required at any moment.

Switch Gear.

The next most important factor upon which continuity of supply depends is the type of control gear by which the generators are regulated, and through which the output of energy passes to the various circuits. The plant usually installed for the operation of stoking machinery, elevators, conveyors, and telphers has in the past been of a rather primitive character in this respect. On such plants interruptions are regarded as inseparable from the use of electrical power, and are taken in a philosophic manner by those responsible for the running of the various units of the plant. But for electrically driven exhausters continuity in the most literal sense is the very first essential; and unless this condition can be fulfilled, there should be no question of applying electricity for the purpose.

For instance, the falling of a generator circuit-breaker or the blowing of a fuse is of little moment, and simply means that the various machines will be stopped for the short period necessary for the replacement of the fuse or breaker, but where exhausters form a portion of the load, such interruptions cannot be permitted, and the generating plant must be so arranged as to ensure continuity of supply under all conditions. The degree of reliability essential in the actual generating plant has already been outlined; and, given these conditions, there is not much fear of the supply failing as a result of trouble in the machines themselves. The whole question now turns upon the switchgear; and it is essential that this should be so arranged as to render it impossible for the occurrence of an external fault to cut off the supply to the exhauster motors.

The practice of installing overload circuit-breakers on the main generator panels cannot be regarded as either a good, or even necessary, procedure, provided an adequate degree of individual protection is secured on the different circuits. The first line of defence, so to speak, is afforded by either fuses or circuit-breakers on the motor starting panels about the works; while the feeder lines, from which the motors draw their supplies of energy from the main distribution board bus-bars, are similarly protected on that board. If, in the face of these appliances, there is necessity for further automatic protection on the dynamo board, it is a sure sign that the electrician in charge is qualifying for the "Order of the Boot;" and the wise chief will invest him with this decoration before he puts the plant on the scrap heap.

Apart from any overload protection on the dynamo panels, there are two or four (according to whether the "S. P." or "D. P." system is installed) protective devices between the dynamos and the motors.

On a well designed system, the protection of the motors and the distribution lines will be provided by the appliances to which reference is made in the preceding paragraph—such apparatus being quite distinct and separate from the appliances provided for the protection of the generators themselves; and the latter devices may safely be of a type which will only come into operation upon the occurrence of an internal fault in a dynamo. This requirement is met by reverse current circuit-breakers, which, in the event of a

fault occurring on a dynamo running in parallel with another, will automatically disconnect the machine from the bus-bars. If overload devices be fitted on the dynamo panels, it is quite possible that a bad fault on a feeder will throw out both these switches as well as the switch on the faulty feeder circuit, and so will cause a shut-down that cannot be termed unavoidable. The use of reverse current breakers on the dynamo board in conjunction with overload devices on the distribution board, provides adequate protection and ensures that only in the case of an internal fault on the dynamos themselves will the bus-bars become dead.

Supervision.

The degree of satisfaction with which any power plant operates is largely dependent upon the supervision. On small works having (say) one stoking machine and a couple of conveyors driven by motors, there is not the same necessity for a highly qualified engineer in charge, as on a works having a large electric power load supplied from a central generating station. On the other hand, it is necessary that even the small works should have on its staff a good working electrician. Where an electrical man is not kept, outside assistance has to be procured in the even of a breakdown; and, apart from the fact that such assistance is always expensive and not always efficient, the interruption in gas making, or diminution in the makes while assistance is being arranged for, will be responsible for losses that would go a long way towards paying the wages of a good working electrician.

Reliability.

The proved reliability of the old single-cylindered steam engine is largely responsible for its wide application for driving rotary exhausters. For purposes of economy at light loads, these engines are sometimes fitted with expansion valve gearing, and for large exhausters compound engines are sometimes used. But in the majority of cases the work is performed by a single-cylindered non-condensing steam engine. While this machine is undeniably a steam eater, it is, above all things, reliable—a factor of paramount importance, and one which cannot, in any degree, be sacrificed for low running costs. When steam engines are used for exhauster driving, it is usual to regulate the pull on the hydraulic main by a bell governor connected to a ballanced throttle-valve on the main steam pipe.

Gas engines are used for exhauster driving to some extent, particularly in small works, and while they have been proved as reliable as the steam engine, they are not suitable for installations in which the throttle method of governing is favored, as their use necessitates a bye-pass compensator for regulating the pull. Both these methods of governing are applicable to an electrically operated exhausting plant. Outside the works, in dealing with electrical power competition, it is evident to the gas engineer that the electric motor is not as reliable as either the steam or gas engine; while the statistics of the leading machinery insurance companies prove that the percentage of breakdowns among insured electric motors is greater than with gas and steam engines; and these considerations alone tend to make him rather reluctant to place so important a unitat the mercy of the electric drive.

Of late years another factor has cropped up which must have a distinct bearing upon the matter, and that is the extent to which gas engineers all over the world are placing their most important machines in charge of the electric drive. It is quite apparent that, so far as absolute reliability is concerned, there is a great difference between a motor, usually neglected and uncared for, on the average small power consumer's premises, and a machine that is always under the eye of a qualified power plant engineer.

By far the greater percentages of motor troubles on a well maintained plant are due to under-rating—a form of abuse to which no power generator is so subjected as the electric motor. Certain types of motors have a great capacity for dealing with overloads, and in placing an order for an electric motor it is not sufficient to specify that the motor must be capable of a certain continuous output. If immunity from trouble is desired, the ultimate temperature rise must be considered. For instance, the temperature rise in a type of motor used on modern battleships is guaranteed not to exceed, in any part of the machine or windings, 70° F., immediately after a six hours' run at full load. The effect of an overload on an electric motor is purely thermal—the rise in temperature being proportional to the amperage passing through the windings, and the time; and any attempt to run a motor continuously on a load in excess of its rated capacity, expressed on a thermal basis, sets up a process of slow deterioration in the windings, and leads to an ultimate short-circuit and total destruction of the insulation.

Economy.

The degree to which economy will be served by the application of the electric drive to the main exhausters depends largely on the general lay-out of the plant, its condition, the rate at which electricity can be purchased or generated on the works, and the way the works steam-generating plant is arranged. For many purposes steam is essential on a gas works; and in cases where this supply is derived from the boilers used for the steam engines driving the exhausters; it is, of course, essential even after the turnover to the electric drive, that one of these boilers be kept under steam. But in any case, the reduced load on the boilers, due to the change, will greatly reduce the fuel, cartage, and possibly the labor charges.

On the other hand, where a battery of boilers is used exclusively for driving the exhausters, the alteration in the method of driving will permit of this battery being entirely shut down. So much depends upon the general arrangement of the plant, and the local conditions, that it is impossible to discuss this phase of the subject in any other than in a general way.

In the actual cost per B. H. P. hour for driving the exhausters, there is likely to be a considerable reduction, particularly when the application of the electric drive permits of a battery of boilers being shut down. The following figures give a rough comparison of the respective costs of driving by steam and electricity, and can be adjusted to suit any particular case under consideration.

Steam Drive Cost.

The single cylindered non-condensing steam-engine usually employed for this class of work is notoriously inefficient. Some years ago a census carried out in the neighborhood of Birmingham on a large number of steam plants, showed the average consumption of coal per 1-h. p. hour was 18 pounds. This, of course, seems extraordinary, but when we consider the steam-eating propensities of these old engines, and the state of disrepair into which so many are allowed to fall, there is little doubt that it was correct.

The fuel used in practically all gas undertakings for steam rising is coke or breeze, or a mixture of these. Let us assume that, in the case under consideration, the steam consumption of the engine is 50 pounds per b.h.p.-hour, and that for one pound of fuel under the boiler, we obtain a vaporation of 7 pounds of water. This gives a fuel consumption of about 7 pounds per b.h.p. hour; and assuming a fuel at $4.50 per ton, our costs for fuel alone is 1.36 cents per b.h.p. hour. In order to obtain the total running costs, the following charges must be added to this figure: (*a*) Interest and depreciation, (*b*) insurance, (*c*) attendance, (*d*) fuel cartage, (*e*) water, (*f*) maintenance, (*g*) lubrication; and where the boilers are used for other purposes than driving the exhauster, the power costs in regard to the exhausters must be debited with their proportion of these charges.

Electric Drive.

Let us assume that the electric motor used has an efficiency of 85% at the average load of the exhauster. The consumption of a D. C. motor having an efficiency of 85% will be 0.8776 B. T. U. per b.h.p. hour; and assuming that the electrical energy can be generated for 2 cents per unit, the costs for current alone will be 1.7552 cents per b.h.p. hour. In order to obtain the total running costs, the following factors will have to be added to this figure: (*a*) Interest and depreciation, (*b*) insurance, (*c*) attendance, (*d*) maintenance, and (*e*) lubrication. In this, *a c d* and *e* will be considerably less than in the case of the steam drive. As a matter of fact, the attendance charges would be almost eliminated, as in the case of the steam drive the attendance charges would chiefly consist of the firemen's wages.

Assuming that the conditions outlined under these headings can be substantially complied with, the argument in favor of the electric drive turns upon the combination of plant which offers the greatest degree of reliability and flexibility. The direct coupling of electric motors to exhausters cannot, except in the case of very small machines, be regarded with much favor, because the price of an electric motor varies inversely with its speed.

The author now proposes to discuss three methods of coupling exhausters for electric operation; assuming that the motors are 10 B. H. P. machines, and the exhauster speed is 110 revolutions per minute.

The motor may be coupled to the exhauster by a single reduction spur gearing. The pinion on the armature shaft may be either of steel or of reinforced fibre or paper. When all metal gears are used, the train should be enclosed in a steel gear case, the lower portion of which forms an oil-bath in which the teeth dip. This allows of a fairly high speed—say, 600 to 700 revolutions per

minute—and hence a moderate priced motor being used. It is also an easy matter to change a motor if necessary.

The motor may be coupled to the exhauster by a silent chain drive, which allows of a greater distance between the driving centres of the motor and the exhauster than could be negotiated by a single spur gear. As in the previous case, the chain and its sprockets should be run in an enclosed oil-bath.

These two arrangements are pretty much on a par as regards simplicity and efficiency; their respective advantages depending upon the nature of the space provided, and the general surroundings.

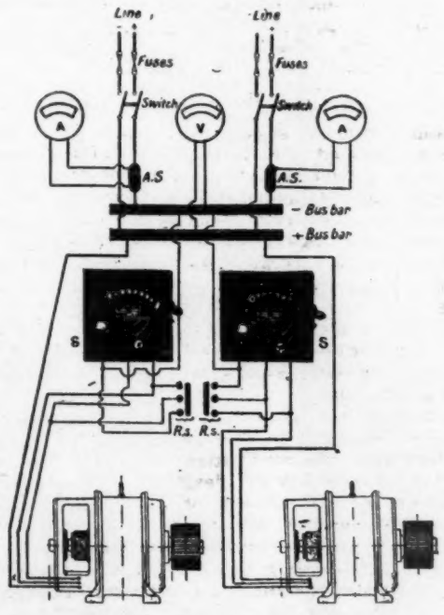
A high-speed, and hence a comparatively cheap motor can be employed to drive a comparatively slow-speed exhauster by having the motor direct-coupled to a reduction gear-box on a combination bed plate bolted to the bed of the exhauster. While this arrangement allows a cheap motor, the saving in first cost is more than swallowed up by the cost of gear for reducing the high motor speed down to the exhauster. As in the case of the steam-driven exhauster, on comparatively large works the dictates of prudence would demand that the exhauster sets, complete with their control gear, should be laid down in duplicate; each set being capable of dealing with the maximum make.

In an installation comprising two separate and distinct sets of exhausting plant, the following points constitute, in the writer's opinion, small factors in design which, although not expensive in themselves, will contribute largely to the maintenance of the plant in an efficient condition, and will insure it against electrical troubles:

1. The feeders to the exhauster control gear from the generating station bus-bars should be in duplicate, and should be each capable of carrying the current required for the operation of both exhausters, should it ever be necessary to run both at the same time.

2. On arrival at the exhauster control board both feeders should be taken through fusible cut-outs and on *via* double pole switches to a small pair of bus-bars, from which the control gear would derive its supply. This arrangement would permit of the feeders being used either singly or in parallel, and would allow of the fuses being withdrawn, for either examination or rewiring, without interrupting the supply to the running set.

3. The two starters should be each supplemented by a "running" switch, the function of which should be, when closed, to reproduce the electrical conditions made by the starter on its last notch. The closing of this switch would permit of the working starter being disconnected and removed, changed, repaired, and replaced without stopping or changing over the exhausters.



Switchboard and Connections.

A.—Ammeter. AS.—Ammeter Shunt. V.—Voltmeter. S.—Starting Switch. Rs.—Running Switch.

The conditions outlined under these headings are shown diagrammatically in the cut, where an exhauster switchboard, complete with fuses, meters, switches, starters, and running switches is shown connected down to two exhauster motors.

Exhauster sets in duplicate, and the control gear outlined above, would seem to give ample protection against the possibility of stoppage due to mechanical or electrical troubles. But it would also be advisable to keep a spare motor ready to put into place at the shortest notice.

But using modern clutches and a suitable lay-out of chain gearing, it would be possible to arrange for motor driving either exhauster, and of changing over without stopping. But taking all things into consideration, it is doubtful if any real advantage would accrue from so elaborate a lay-out, as it would involve the continuous running of a lot of extra gearing, and would place the entire plant at the mercy of the single transmission system.

Governing.

Where the bye-pass compensator method is used for regulation of the pull, there is no need for automatic regulation of the motor speed, although rheostatic hand control of the speed may be provided. When the pull is regulated by the automatic variation of the speed of the exhauster, the bell governor employed in connection with the steam engine drive constitutes an automatic element, and could be coupled-up to a suitable shunt regulator in much the same way as it was connected to the balanced throttle valve.

As has been mentioned, the shunt wound variable speed motor is particularly suited for this class of work. It is desirable that a totally enclosed gas tight motor be employed; and bearing in mind that the great majority of electrical troubles are due to underrating, it is essential that the motor be of sufficient capacity to operate continuously without undue overheating. It is important that the general design of the machine should be such as to permit of a thorough daily inspection, allow easy access to the commutator and brush gear, and have ample facilities for blowing out and cleaning.

In conclusion, the author desires to make it clear that he does not mean these notes to represent standard practices in electrical operation of exhausting plant; his intention being to simply indicate the general conditions which, in his opinion, have to be fulfilled before the elecric motor can be successfully applied for this purpose, as the subject is one on which there is very little available data—exhausting plants driven in this manner being comparatively rare.

Coke Concrete Found Strong After Seven Years.

About seven years ago the writer was called upon to underpin the front wall of a battery of coke ovens at Segundo, Colo. It has been the custom to "pull" the ovens by hand, and certain changes were necessary in the wharf level to provide for the installation of coke-pulling machines. In order to lower the wharf 2 to 3 feet, as planned, it was required to extend the face wall lower with suitable foundation. The underpinning was to extend at least 2 feet below the new wharf level, and, being thicker than the old wall, was to be carried up the face a short distance.

Suitable sand or gravel could be obtained only by shipping from outside points at considerable expense, but there was available at the plant large quantities of coke breeze, ranging in size from dust to about 1 inch. Coming directly from the ovens, it was clean and free from vegetable matter, and it was accordingly adopted for use as concrete aggregate, in the proportion of six parts coke to one part cement.

The mixture, when wet, formed a mass of brownish color weighing about 80 pounds per cubic foot; it was very easily mixed, handled and placed in the forms, and when hardened and brushed with cement grout, resembled ordinary sand and rock concrete, although not obtaining as hard a set. A week or ten days after placing, however, it would resist quite a sharp blow without fracture, and carried the load of the heavy wall without any appreciable settlement. An examination recently showed that the mass had hardened to a degree approaching the strength of the coke, and, while chipped and broken off in places exposed to heavy wear, is serving its purpose very well.

Since this work was done, coke concrete has been used for a number of other purposes in some of the other Colorado coal and coke plants. At Tabasco, one of the fuel companies has erected a number of coke-concrete block houses, and I am informed that they are much drier and more satisfactory than stone concrete block structures. The cost of making the blocks are about two-thirds the estimated cost of stone-concrete blocks.—*H. E. Heron in "Engineering News."*

Items of Interest from Various Localities.

THE new water gas plant for the North Adams (Mass.) Gas Light Company has been completed and tried out. A feature of the plant is the unusual height of the roof above the operating floor, with a monitor which provides plenty of good air to the operators. The new set gives the company ample capacity for some time to come, and guards against interruption to service in case of accident to the other set. The capacity is 700,000 cubic feet per day.

IN an action brought by the Georgia Railway and Power Company, to recover from a lighting customer who had refused to pay his bill for current and some electric lamps, the Court of Appeals of Georgia held (88 S. E. 33) that the $5 deposit made by the customer was not for the purpose of paying any bills which he might owe the power company, but was made as collateral security for the faithful performance of all of the terms and conditions of the contract.

IT is not often that a public utility company is able to assist the suffering and at the same time directly advertise its business without loss of self respect. This, however, was the good fortune of the Knoxville (Tenn.) Gas Company, quite recently. A severe fire broke out in a district of Knoxville, called McAnally Flats, and as many of those burned out were of the poorer class, there was considerable destitution. Luther Gaston, new business manager of the company, conceived the idea of a biscuit baking contest in the company's sales room, the products to be distributed to these homeless people. From early in the morning until late in the afternoon two large ranges were utilized by crews headed by E. G. Palmer and K. B. Duncan, employees of the company. These men assisted the women who made up the dough, cut out the biscuits, etc. As fast as the biscuits were baked they were pilled in two show windows, until the entire space was occupied. The curiosity of passersby was great and their interest intense when they learned of the charitable endeavor.

FRANZ KRULL, Ltd., of Reval, Russia, through their general manager. Mr. Maxim L. Kagan, who is here on Government business, have just placed an order with H. L. Barnitz, sales agent of the International Oxygen Company, for a large oxy-hydrogen plant of the unit type generators, the gas to be used for welding. Mr. Kagan recently placed orders for refrigerating machinery for the Russian government, aggregating over half a million dollars.

THE Association of National Advertisers, representing the leading general advertisers of America, has taken a forward stand with regard to honest advertising. At their annual meeting at Dayton, O., the following declaration of principles was unanimously adopted:

Resolved, that we are opposed to advertising of the following kinds: All advertising that is fraudulent or questionable, whether financial, medical or any other; all advertising that is indecent, vulgar or suggestive, either in theme or treatment; that is "blind" or ambiguous in wording and calculated to mislead; that makes false, unwarranted or exagerated claims; that makes uncalled-for reflections on competitors or competitive goods; that makes misleading free offers; and any advertising that may cause money loss to the reader or injury in health or morals or loss of confidence in reputable advertising and honorable business.

THE Newport (R. I.) Gas Company anounces that it will make, on or before October 1, 1916, a reduction of 10 cents per 1,000 cubic feet in its rates.

THE Florida Utilities Corporation has purchassed the Ocala Gas Company, and will enlarge the plant and improve it, besides laying several miles of new mains. The new owners of the utility will spend about $28,000 in improvements, according to report, and this will bring it up to modern requirements. The extension of the gas mains will be an especially desirable feature, as it will give gas service in some of the best suburbs.

THE street lighting franchise in Alton, Ill., held by the Piata Light and Power Company, has been transferred by vote of the City Council to the Alton Gas and Electric Company. The former company has heretofore purchased current from the Alton Gas and Electric Company.

A NEW holder, of 100,000 cubic feet capacity, is being constructed for the Spencer (Mass.) Gas Company by Davis & Farnum, Waltham, Mass. It will be ready for use by early winter.

NEGOTIATIONS are said to be under way for the sale of the gas distributing plants in Kansas City, Mo., and Kansas City, Kas., to the Cities Service Company, provided that company is able to purchase the Kansas Natural Gas Company. The United Gas Improvement Company owns both the Kansas City distributing companies, and also some of the bonds and stock of the Kansas Natural. It is asserted that the U. G. I. desires to get out of the natural gas business and devote all its attention to artificial gas.

THE Wisconsin Public Service Company will adopt the continuous billing system in Green Bay, the change from the old system of having two discount days in a month to that of having every day, except Sundays and holidays a discount day, will be inaugurated on July 1. Districts have been mapped out in the city to carry out this plan. Meter readers will complete their work in the individual districts, and the following day bills will be rendered to customers. Discount will be allowed as late as 10 days after the date meter is read. There are 6,600 customers using gas and electricity. About one-half of them pay bills by mailing checks, the other half settle at the office. Nearly half of those who pay bills at the office generally wait till the last discount day.

PERMISSION has been secured by the Southern Illinois Gas Company to lay mains on the country roads from Marion to the county line on the west, and work will be started at once. This will be on the line connecting Marion, Carterville, Carbondale and Murphysboro. The line to Johnston City will be built after this one is completed. The right of way to the west has been secured and most of that for the Johnston City line is now signed up. The village of Crainville has granted a franchise to the company. The pipe line will pass through that village when laid from Marion to Carterville.

THE St. Petersburg (Fla.) municipal gas plant shows an increase of about 50% in send-out for May, 1916, over the month of May, 1915, according to the report of Commissioner of Works Hammond. Consumption for May, 1916, was 1,131,938 cubic feet against 766,331 cubic feet for May, 1915, a difference of 365,607 cubic feet. Commenting on the increasing patronage of the gas plant, Commissioner Hammond says that the prospects indicate the department will be overwhelmed with demands for new service this fall. Notwithstanding the exodus of residents for the summer vacation, sixteen new services were installed during the past month.

A DELAWARE charter has been granted the Gulf Cities Gas Company to produce and distribute gas and all products thereof. The incorporators are Harry H. Phillips, Charles J. Horn, Burrell J. Cramer, Chicago, Ill.

SAUSALITO, Cal., town trustees have granted a gas franchise to J. F. Fish, representing San Francisco capitalists who will organize a corporation. The franchise provides that work on the plant must begin within ninety days and that the rate charged for gas shall never be higher than $1.10 per 1,000 cubic feet. Work will be commenced as soon as the company is incorporated.

WYANDOTTE, Mich., has accepted the offer of the Detroit City Gas Company to supply gas at 80 cents for 1,000 feet instead of $1 previously charged. The rate is to be effective until January 1, 1917. The people will be given an opportunity to vote on a 75-cent rate at a special election during the fall primaries. Under the present terms, the city receives a rebate of 5 cents for each 1,000 feet. Under the 75-cent. rate this rebate would be of direct benefit to the people instead of going to the city treasury.

A FRANCHISE has been granted the Portland (Ore.) Gas and Coke Company by the County Commissioners, permitting the laying of mains between the city limits of Portland and Union avenue, extended northerly, and the Sandy River, and also in that part of the county lying south of the Barnes road and west of the Williamette.

PEMBERTON, Hull, Kenberma, Nantasket and North Cohasset, Mass., are to have gas. The Hull Gas Company has been organized for this purpose, the moving spirits being Messrs. Bowen Tufts of Arlington, J. J. Moore of Hingham, and J. L. Mitchell of Hull.

THE Brockton (Mass.) Gas Light Employees' Association has chosen William P. Morton president. Other officers elected were: Vice-President, Hector Mongeau: Recording Secretary, Owen Carroll; Financial Secretary, Eugene LaRoque; Treasurer, Mark Fitzmaurice; Trustees, George H. Priest, John Murray and Edward Jordan. All of the retiring officers were given a vote of thanks.

APPLICATION has been made by the Jackson County Light, Heat and Power Company with the Missouri Public Service Commission for permission to change its schedules of gas rates in Independence, where they were lowered on August 17, 1915, from $1.25 to $1.15 per 1,000 cubic feet. Automatically, under the franchise another reduction is due on August 17, 1916, bringing the rate down to $1. In its petition the company says that the cost of gas oil and all materials used in the manufacture of gas have advanced since November, 1915, and that the rate fixed by the franchise will not only render no adequate return on the value of the property, but will so diminish the returns as to make it impossible for the company to meet its obligations. It also declares that the system of making a flat rate to all consumers is inequitable. The change suggested is a sliding schedule, as follows: $1.25 per 1,000 feet for the first 5,000 feet, $1.10 for the second 5,000 feet and 95 cents for all over 10,000 feet.

THE Indiana Commission has fixed a new schedule of gas rates for Terre Haute, to take effect June 15, as follows: For the first 2,000 cubic feet, 85 cents per 1,000; for the next 1,000 cubic feet, 80 cents; for the next 2,000 cubic feet, 75 cents; next 5,000 cubic feet, 70 cents; next 5,000 cubic feet, 65 cents; next 5,000 cubic feet, 60 cents, and next 5,000 cubic feet and all in excess, 50 cents. The former rates ran from $1 per 1,000 cubic feet to 75 cents. The commission approved the plan whereby the company installs the service to the property line and the consumer from there to the meter. The company will be required to pay $1,751.29 for the examination made by commission engineers and auditors. The commission decided the company should not be entitled to any valuation of its property for lines not actually installed. The cost of paving, which actually was cut by the company, was allowed as an item of value. The commission allowed 12% of the total valuation, less materials and supplies for engineering expense. The total reproduction cost, as fixed by the commission, is $895,000, and the present value is $770,000. To this valuation the commission added an allowance of 8% for "going value," making the total value $966,600 to be reproduced and the present value $831,600. An allowance is made for depreciation of property of 1½%.

THE Wahpeton (N. D.) City Council is considering, on the request of two Iowa men, for a gas franchise, it being proposed to supply Breckenridge and Wahpeton from the same plant. The Breckenridge council has already passed the ordinance granting the franchise, but it will be submitted to a vote of the people. In Wahpeton the action of the council, for or against, would be final.

THE St. Clair County Gas and Electric Company states that the lower rates to be charged for gas in Belleville, Ills., will not apply in East St. Louis. They say: "We lowered the rates on gas in Bellville because natural gas has been piped into that city and the company is giving Belleville patrons the benefit of the lower cost of the gas. The field is insufficient, however, to supply East St. Louis, and as a result the East St. Louis rates will be based on the cost to manufacture coal gas, which is somewhat higher."

AT the last meeting of the Rockford (Ills.) Gas Light and Coke Company's Employees Association, brief addresses were made by Mr. Austin Burt, Manager of the Citizens' Gas and Electric Company, of Waterlooo, Ia., S. P. Curtis, General Manager of the American Gas Co., Philadelphia, H. S. Whipple, Manager of the Rockford company and Harry L. Wolfe, its New Business Manager.

COL. E. S. DICKEY.

GOVERNOR HARRINGTON, of Maryland, has appointed Edmund S. Dickey a Colonel on his personal staff. Mr. Dickey is Manager of the Maryland Meter Works of the American Meter Company; a member of the American Gas Institute, the Wisconsin Gas Association, the Illuminating Engineering Society, Michigan Gas Association, Pacific Coast Gas Association, and National Commercial Gas Association; and one of the best known men in the meter game.

F. A. WOODHEAD, who has been acting manager of the Arlington and Lexington, Mass., gas companies, has been appointed business manager of these utilities. Mr. Woodhead entered the employ of the organization as an engineer with the Light, Heat & Power Company, and was afterward transferred to the Gas & Electric Improvement Company as an auditor. His ability as a manager is attested by the remarkable growth of the companies business, both in Arlington and Lexington. During the 10 months to May 1, 647 new meters were installed, or a gain of about 12% of the whole number installed at that time.

GEORGE S. SPEAKER, general manager of the Lebanon (Pa.) Gas and Fuel Company, is heading a team to raise $40,000 for the Y. M. C. A. of his city.

A. C. M. AZOY, of the Berwind-White Coal Mining Company, has been appointed on the committee on securing new members of the American Gas Institute. Mr. Azoy could easily get a 100% mark for attendance at gas conventions, and his advice is often sought. He has declined many committee appointments on account of the demands upon his time, but no one has a larger acquaintance, and he should be able to round up many new members for the Institute.

J. B. CRAWFORD, of Mattoon, Ills., has been named to succeed the late Arthur Walsh as assistant commercial manager for the Wisconsin Gas and Electric Company at Kenosha, and will act in an advisory capacity for the company's plants in Racine, Burlington, Delavan, Watertown, Elkhorn Whitewater and Lake Geneva.

SUPT. CHARLES R. PRICHARD of the Beverly (Mass.) Gas and Electric Company attended the reunion of his class at the Massachusetts Institute of Technology on June 14th.

THE Reading, Mass., "Chronicle" says: "Manager George Barnes, of the Malden & Melrose Gas Light Co., is back from the 'Preparedness Camp' at Fort Oglethorpe, Georgia. He says that it beats Plattsburg, where he originally intended to go, all hollow, for Plattsburg never had a temperature of 107 such as he experienced. He's glad he went and glad he's back. He left a few pounds South, but he could spare them. In fact, he looked so well that his picture was published in the 'New York Times'—with the rest of his company, which comprises business and professional men. George is prepared."

ABOUT 250 employees of the New York Edison Company and the Consolidated Gas Company are members of the National Guard, and the managements of these companies say that employees who answer the mobilization call will receive vacations with full pay for the entire time they are engaged in military duty.

Financial Notes.

IN the annual report of the MIDDLE WEST UTILITIES COMPANY, for the year ended April 30, 1916, Samuel Insull, president, says: "For the first few months of this fiscal year there was a general depression in business all over the country. Not until September, 1915, was any marked improvement shown. At the end of August the gross income of the subsidiary companies was $107,275.95 lower than in the previous fiscal year. To the general improvement in business since then, the earnings of the subsidiary operating companies responded remarkably well, with the result that their gross earnings for the whole year substantially increased over the previous year." The combined earnings of the various subsidiaries for the fiscal year were as follows:

Gross earnings		$8,091,148
Operating expenses, including taxes		5,013,388
Net earnings from operating		$3,077,760
Rentals on leased properties		191,645
		$2,886,115
Interest charges paid or accruing to outside holders	$1,339,412	
Amortization of discount on securities	24,642	
Dividends on stock and proportion of undistributed earnings to outside holders	206,093	
		1,570,147
Total earnings accruing to company		$1,315,968
Of the above amount the company received and accrued as interest on bonds and debentures	$503,070	
Received and accrued as interest and brokerage on money advanced	234,993	
Received and accrued as dividends on stocks	447,175	
		1,185,238
Surplus carried to the aggregate surplus accounts of the subidiary companies on their own books		$130,730

A. B. LEACH & CO. are offering $2,100,000 CENTRAL INDIANA GAS COMPANY first mortgage 5% sinking fund gold bonds, maturing Sept. 1, 1931, on a basis to yield over 5.50% to the investor. The bonds are secured by first mortage on all the property of the company, the value of which is largely in excess of all outstanding bonds. The company serves a total population of 116,000, including active, prosperous and long-established manufacturing plants—in which field the possibilities for expansion and increased income are exceptional. This condition assures steady earnings as well as possibilities for expansion. Through its management, including such able public utility operators as Rufus C. Dawes, the company is assured of efficient and economical operation.

AMERICAN GAS AND ELECTRIC COMPANY has declared its regular quarterly dividend of 2½% on the common stock, and an extra dividend in common stock of 2% on the common, both payable July 1 to stock of record June 19. The regular quarterly dividend of 1½% on the preferred stock was also declared, payable August 1 to stock of record July 18.

THE STANDARD GAS AND ELECTRIC COMPANY reports for the year ended April 30, last, these comparisons:

	1916	1915
Gross Income	$1,969,429	$1,488,381
Expenses and Taxes	47,125	36,313
Net Income	1,922,304	1,452,068
Interest	849,388	821,794
Balance	1,072,916	630,364

THE aggregate gross earnings of UTAH SECURITIES CORPORATION subsidiaries increased 9%, and net earnings 22% during the year ended March 31, despite the unfavorable business conditions prevailing during the first three months of the period. Of the year's total gross increase of $426,160 all but $81,730 was made in the last six months, and of the year's total net increase of $482,135 all but $151,280 was made in that period. General business conditions in the territory served are now excellent, and it is believed that the earnings will continue to show a substantial growth.

The operating companies increased the electric and gas customers during the year from 47,762 to 53,397. A statement of the combined net income account of the Utah Securities Corporation and its subsidiary, the Utah Power and Light Company, including the subsidiaries of the latter, for the twelve months follows:

Gross earnings of Utah Securities Corporation, including surplus of subsidiary companies accruing to it		$1,258,029
Expenses, including taxes, of Utah Securities Corporation		208,911
Net earnings of Utah Securities Corporation, including surplus of subsidiary companies accruing to it		$1,049,118
Profit on redemption of Utah Securities corporation ten-year 6% gold notes retired during the year	$499,885	
Less commission	34,112	
		465,773
Income from all sources accruing to Utah Securities Corporation		$1,514,891
Deduct interest charges on ten-year 6% gold notes		888,974
Combined net income		$ 625,917

Current Prices of Public Utility Securities.

	Bid.	Asked.
American Gas Co	120	122
*American Gas & Electric	146	148
*American Gas & Electric pf	50	52
American Light & Traction	381	386
American Light & Traction pf	110½	112½
American Power & Light	68	70
American Power & Light pf	85	86½
American Public Utilities	45	47
American Public Utilities pf	76	79
Associated Gas & Electric pf	55	65
Atlantic P. & L. pf	92	95
Brooklyn Union Gas Co	125	127
Cities Service	278	280
Cities Service pf	87	88
Colorada Power	24	25
Colorado Power pf	99½	101
*Commonwealth Pr., Ry. & Lt	64½	65
*Commonwealth Pr., Ry. & Lt. pf	84½	86
Consolidated Gas Co	134	135
Denver Gas & Electric gen. 5s	97	99
Electric Bond Deposit pf	85	86
Electric Bond & Share pf	99	100
Federal Light & Traction	12	14
Federal Light & Traction pf	45	49
Gas & Electric Securities	280	...
Gas & Electric Securities pf	101	...
Laclede Gas	106	107
Northern States Power	89	90
Northern States Power pf	96	97½
Pacific Gas & Electric	58	59
Pacific Gas & Electric, original	89	91
Pacific Gas & Electric 1st pf	89	90
Public Service	129	130
Republic Ry. & Light Co	35	36
Republic Ry. & Light Co. pf	76	78
*Standard Gas & Electric	15	16
*Standard Gas & Electric pf	40	42
Tennessee Ry., Light & Power	12	13
Tennessee Ry., Light & Power pf	52	53
Toledo Trac., Light & Power	45	47
Toledo Trac., Light & Power pf	82	84
*United Gas Improvement Co	88½	89½
United Light & Railways	52	54
United Light & Railways 1st pf	76	77

*Par value $50

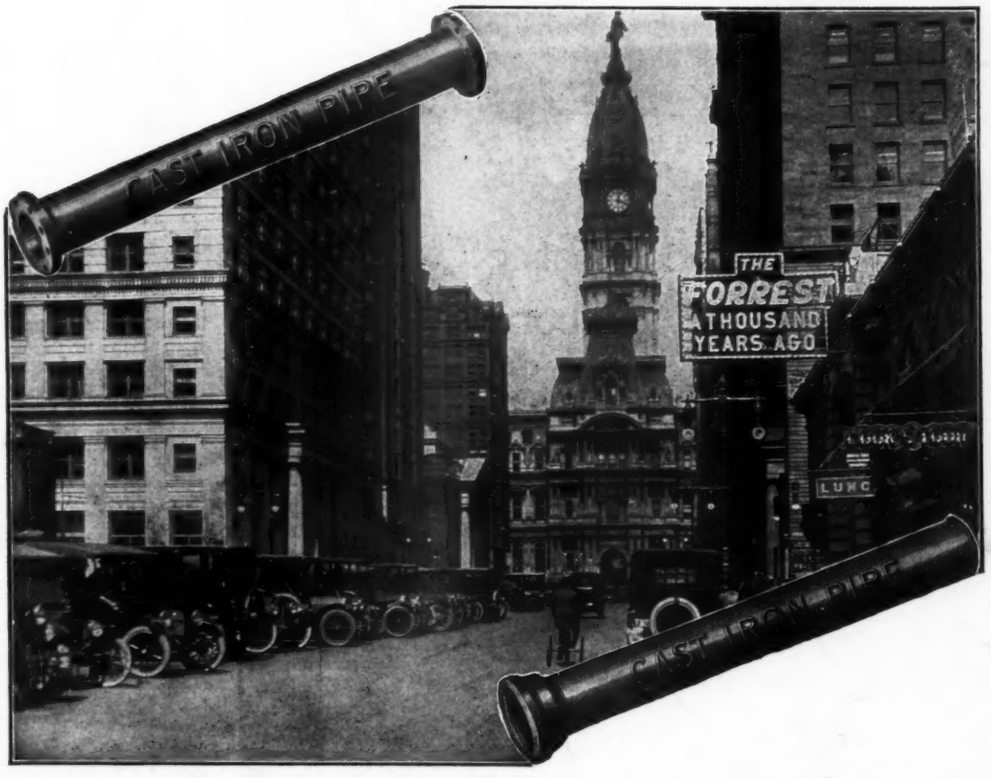
Chemical Lib
JUN 26 1916
U. OF MICH. LIBRARY

AMERICAN
GAS LIGHT JOURNAL
FIFTY-SEVENTH YEAR

VOLUME CIV., No. 26.
Whole No. 3049.

NEW YORK, MONDAY, JUNE 26, 1916.

Subscription. $3 Per Year.
$4 Canada. $5 Foreign.



Cast Iron Pipe Soon Celebrates Its Centenary in Philadelphia

This was one of the first American cities to use cast iron pipe—1817 was the date of its initial installation here, and pipe laid then shows no evidence of deterioration.

After the "experimental" stage was passed Philadelphia bought heavily of Cast Iron Pipe for both water and gas. The 3,331 miles now in use give a fair indication of the high regard in which the city officials hold it.

As a matter of fact Cast Iron Pipe has lasted *too* long in the busier sections of the city—recently some of it has been removed because of its obsolescence, and replaced by larger cast iron pipe.

The following makers of Cast Iron Pipe and Fittings are independent and competing. Inquiries may be sent to any or all of them with assurance of prompt and full response.

United States Cast Iron Pipe & Foundry Co., Philadelphia, Pa.
American Cast Iron Pipe Co., Birmingham, Ala.
James B. Clow & Sons, Chicago, Ill.
Donaldson Iron Co., Emaus, Lehigh County, Pa.
Glamorgan Pipe & Foundry Co., Lynchburg, Va.
Lynchburg Foundry Co., Lynchburg, Va.
Massillon Iron & Steel Co., Massillon, Ohio.
Standard Cast Iron Pipe & Foundry Co., Bristol, Pa.

INDEX TO CONTENTS, PAGE 408.

ADVERTISERS' INDEX, PAGE 20.

KOPPERS

BY-PRODUCT COKE AND GAS OVENS

The most efficient method of carbonizing coal is in KOPPERS OVENS and the best coke and by-products are produced by this process.

H. KOPPERS COMPANY
Pittsburgh, Pa.

Builders of

By-Product Coke and Gas Plants
Tar Distilling Plants
Ammonia Recovery Plants
Benzol Recovery Plants

MANAGERS OF SMALL GAS WORKS

should look into the question of installing

DESSAU VERTICAL RETORTS.

They are built as small as 175,000 cu. ft. per day.
The Investment Cost is low and there is obtained:

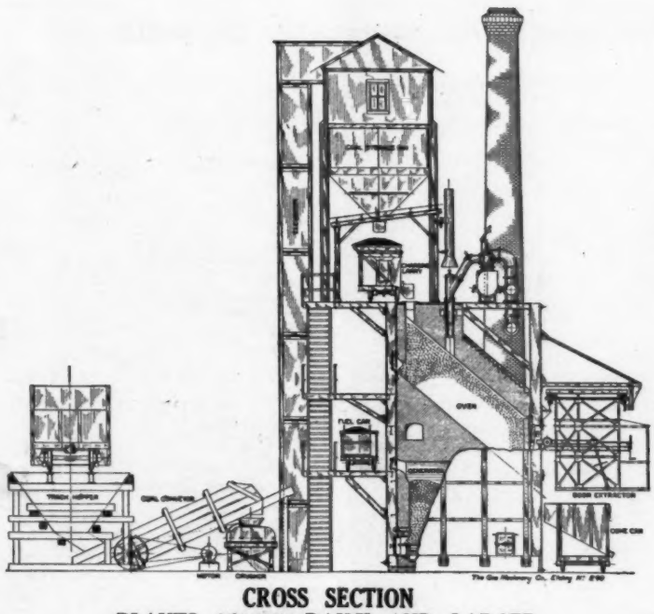
HIGH GAS AND AMMONIA YIELD,
HIGH YIELD OF THIN TAR,
LOW LABOR COST.

WATER GAS CAN BE PRODUCED IN THE RETORTS

Resulting in high yield of standard B.T.U. gas.

THE UNITED GAS IMPROVEMENT CO., PHILADELPHIA,

would be glad to take it up with you.



CROSS SECTION
PLANTS 350,000 DAILY AND LARGER

INCLINED GAS OVENS

ONE PLANT OPERATING.
3,000,000 Cubic Feet Daily under Construction.

ADVANTAGES:

LOW FIRST COST
MINIMUM OF LABOR
TWELVE-HOUR CARBONIZATION
TWO EIGHT-HOUR SHIFTS
LOW MAINTENANCE
HIGHEST EFFICIENCY

THE GAS MACHINERY CO.

CLEVELAND, OHIO

GAS HOLDERS STORAGE TANKS

GAS PLANT EQUIPMENT

PLATE AND STRUCTURAL METAL WORK

THE Stacey Manufacturing Co.

CINCINNATI - - - OHIO

DIDIER-MARCH COMPANY

WORKS: KEASBEY, PERTH AMBOY, N. J. OFFICE: PERTH AMBOY, N. J.

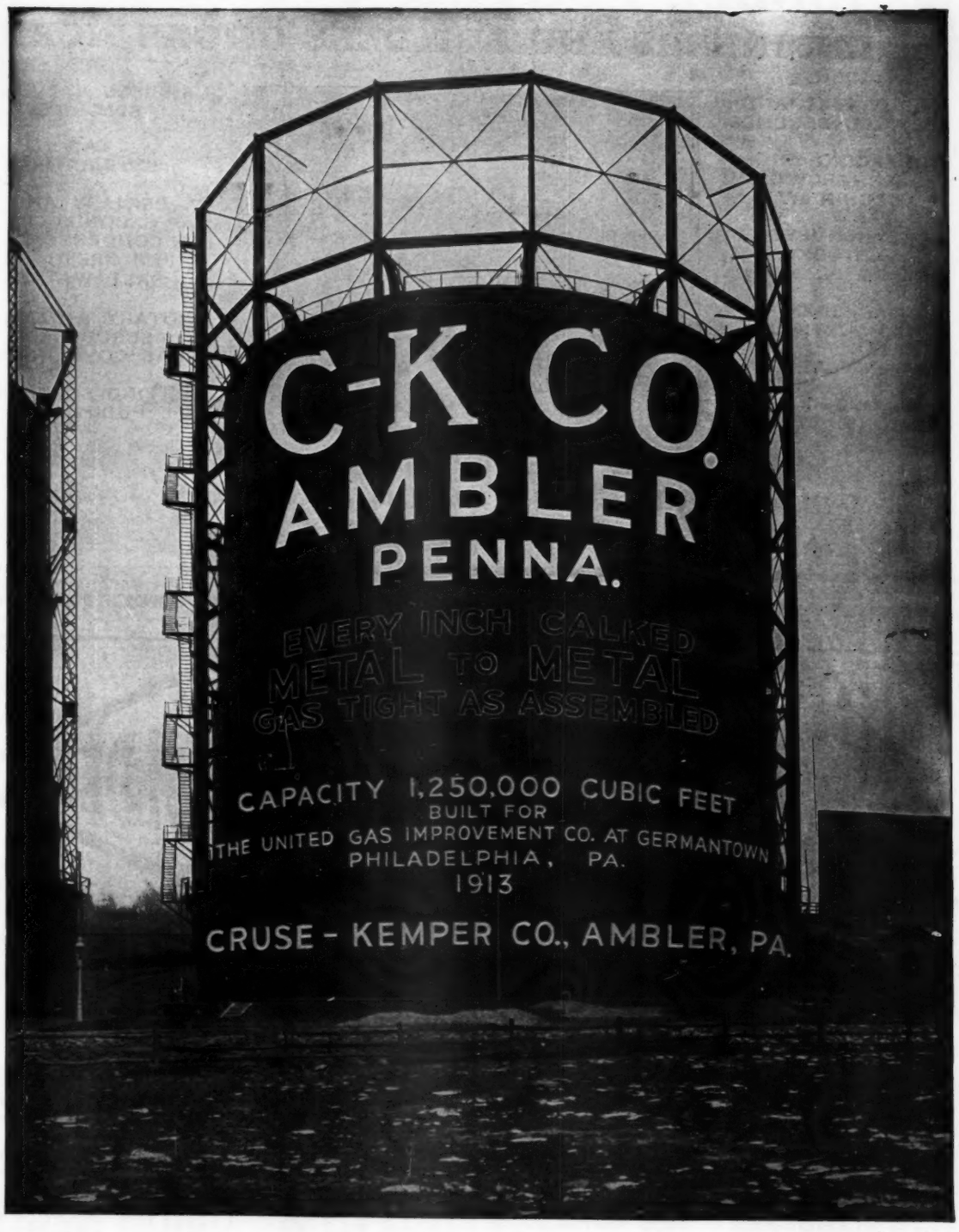
INSTALLATIONS OF GLOVER-WEST VERTICAL RETORTS THROUGHOUT THE WORLD

	Capacity cubic feet per diem. Millions.
St. Helens 1st installation	¼
2d "	1¼
3d "	2
Manchester 1st installation	½
2d "	4
Rochdale	1¼
Tokio	1¾
Lurgan	¼
Helensburgh	½
Sydney (N.S.W.) 1st installation	1¾
2d "	1¾
3d "	6
Bradford	2
Fitchburg (U.S.A.) 1st installation	¼
2d "	¼
Newcastle (N.S.W.)	1
Belfast 1st installation	2½
2d "	5½
Nelson 1st installation	1¼
2d "	1¼
Blackpool 1st installation	¾
2d "	¾
Stockholm (Sweden)	1½
Bergen (Norway)	¾
Newcastle-Upon-Tyne 1st installa'n	2½
Newcastle-Upon-Tyne 2d installa'n	3
Heywood	½
Darlington	2
Oldham	2
Bridgwater	½
Southport	1¼
Cambuslang	½
Nottingham	1½
Tipton	½
Leicester	2½
Exeter	1¼
Barnoldswick	½
Coteborg (Sweden)	1
Cape Town (South Africa)	½
Hong Kong (China)	¾
Berlin (Germany)	¼
Liverpool 1st installation	2½
2d "	2½
Macclesfield	1
Lytham	½
Dunoon	⅜
Pawtucket (U.S.A.)	1
Montreal (Canada)	4
Ottawa (Canada)	1½
Grays & Tilbury	½
Bangor (Ireland)	⅜
Brisbane (Queensland)	1½
Northampton	1¼
Cardiff	2½
North Sydney (N.S.W.)	2½
Bothwell & Uddingston	¾
Springfield (U.S.A.)	1½
Preston	1¼
Portland (U.S.A.)	1
Santos (Brazil)	¾
Lea Bridge	1
Pernambuco (Brazil	¾
Chorley	1¼
Swindon	½
Rochester	1¼
Rothesay	½
Napier (New Zealand)	½
Salford	1¼
Lemberg (Austria)	½
Rhmney & Aber Valleys	½
Holywood	¼
Blyth	1
Stafford	1
Zaandam (Holland)	¾

COMPLETE COAL GAS INSTALLATIONS of all designs. RETORT HOUSES.

COAL AND COKE HANDLING MACHINERY. HIGH CLASS REFRACTORIES MATERIALS.

GAS BENCH AND COKE OVEN SETTINGS. LININGS FOR WATER GAS SETS AND CUPOLAS.


C-K CO.
AMBLER
PENNA.
EVERY INCH CALKED
METAL TO METAL
GAS TIGHT AS ASSEMBLED
CAPACITY 1,250,000 CUBIC FEET
BUILT FOR
THE UNITED GAS IMPROVEMENT CO. AT GERMANTOWN
PHILADELPHIA, PA.
1913
CRUSE - KEMPER CO., AMBLER, PA.

J. S. DE HART, JR.
President

R. K. WEHNER
Treasurer

ISBELL-PORTER COMPANY

GAS ENGINEERS AND BUILDERS OF GAS WORKS

HORIZONTAL AND VERTICAL BENCHES

CHARGING AND DISCHARGING MACHINERY

COKE CONVEYORS AND COKE SIZING PLANTS

MACKENZIE EXHAUSTERS GOVERNORS AND COMPENSATORS

UNGER AMMONIA STILLS

ISBELL VALVES SPECIALS

TAR EXTRACTORS

PRIMARY AND SECONDARY CONDENSERS FOR FRESH OR SALT WATER

ROTARY AMMONIA SCRUBBERS GAS GOVERNORS

SHAVING SCRUBBERS PURIFIERS

MAIN OFFICE AND WORKS
BRIDGE AND OGDEN STREETS
NEWARK, N. J.

ESTABLISHED 1865

HUB END GAS VALVES

Made Bronze Mounted or All Iron for both High and Low Pressure.

SEND FOR CIRCULAR 3

The LUDLOW

VALVE MANUFACTURING COMPANY

TROY, N. Y.

New York 62 Gold Street
Boston Oliver Building
Philadelphia Harrison Building
Chicago The Rookery
Pittsburg First Nat. Bank Building
Kansas City R. A. Long Bldg.

GAS HOLDERS

STEEL TANKS
MACHINERY
FOR
COAL AND WATER GAS PLANTS

DAVIS & FARNUM MFG. CO.

Waltham, Mass.

SEND FOR CATALOGUE

No. 262 Type D Unit.

282

AND HE DID THAT LITTLE THING

A city official—with a conscience—was recently moved to dig into the problem of street lighting. In the process of digging he visited us, here at our office. He got from us facts and figures regarding gas street lighting, with information as to where he might support and supplement these.

The result: gas street lighting was adopted because, all things considered, as most favorable (including the service-maintenance of the Welsbach Street Lighting Company of America).

Whether you are an official for a municipality or a gas company, "do this little thing." INVESTIGATE and you may be sure of receiving from us complete and accurate information.

WELSBACH STREET LIGHTING COMPANY OF AMERICA

"The Largest Contractors for Gas Lighting in the World."

1934 Market Street, - Philadelphia, Pa.

NEW YORK. CHICAGO. ST. LOUIS. BOSTON. SAN FRANCISCO.

No. 162-C Type D Unit.

Building Small Works

is a business by itself. It requires the resources of a complete organization and the personal attention of an experienced engineer whose reputation is enhanced by each undertaking.

"Each day we build better." Write us.

Gas Engineering Company

TRENTON, N. J.

Established 1858 Incorporated 1890

CHAS. E. GREGORY, President — DAVID R. DALY, Vice-President and Treasurer — H. D. ABERNETHY, Secretary

J. H. GAUTIER & CO.

Jersey City, N. J.

COAL GAS BENCHES

SILICA RETORTS AND SETTINGS

Clay Gas Retorts, Fire Brick, Water Gas Linings, Etc.

C. C. Tutwiler, President
Thos. C. Pinkerton, Vice-Pres.
H. A. Matlack, Sec'y & Treas.

ANALYTICAL CONSULTING and ENGINEERING CHEMISTS

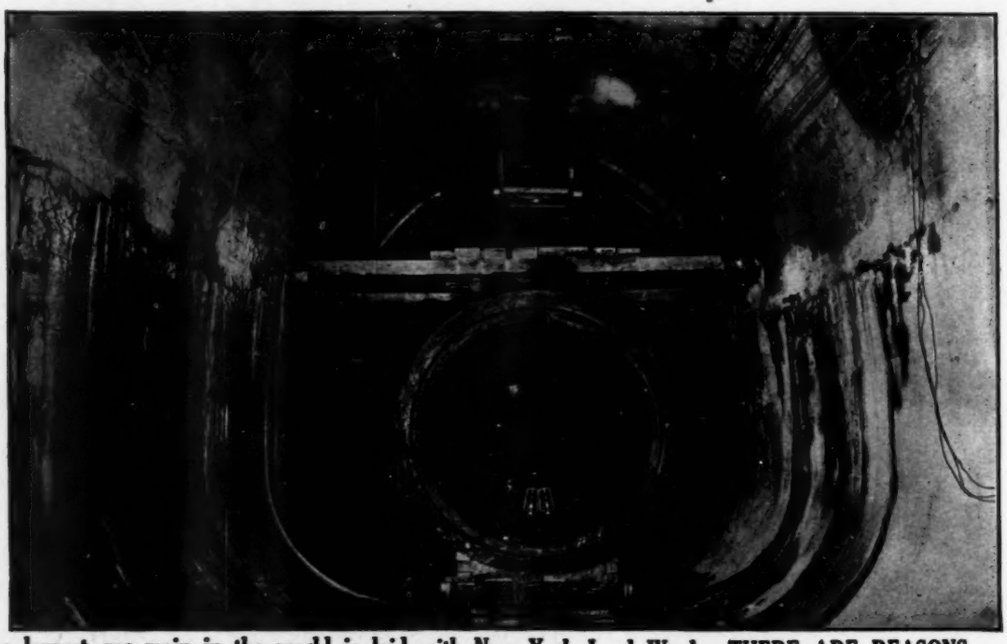
THE CHEMICAL SERVICE LABORATORIES, INC.

1629 Real Estate Trust Bldg.

Philadelphia, Pa.

Analyses and Tests for Gas Works

RAW MATERIALS, PRODUCTS AND BY-PRODUCTS.
SERVICE IN SAMPLING AND IN DRAWING SPECIFICATIONS.
SAMPLE MAILING BOXES SENT FREE UPON REQUEST.



The largest gas main in the world is laid with New York Lead Wool. THERE ARE REASONS.

Let us tell you, and you will be convinced that it is to your best advantage to follow the example of the MEN WHO KNOW. Just drop us a card. We are at your service.

NEW YORK LEAD WOOL COMPANY, 93 Nassau St., New York.

The Parker-Russell Mining & Mfg. Co.

OAK HILL GAS RETORT & FIRE BRICK WORKS

Builders of Complete Coal Carbonizing Plants

BENCHES

Laclede Gas Building
SAINT LOUIS

New England Agents:
WALDO BROS., INC.
45-49 Batterymarch St., Boston, Mass.

THE IMPROVED EQUIPMENT CO.

Combustion Engineers

60 Wall Street New York City

We are Buyers of

SPENT OXIDE

From Coal Gas Works

Send us samples and we will make you an offer

HENRY BOWER CHEMICAL MANUFACTURING CO.

Gray's Ferry Road and 29th Street

PHILADELPHIA, PA.

The By-Products of Coal Gas Manufacture

By K. R. LANGE. 13 Illustrations and Diagrams. 164 Pages. $2.

Contents: Introduction.—Chapter I. Purification of Coal Gas. —Chapter II. Coke.—Chapter III. Retort Graphite.—Chapter IV. Gas Tar.—Chapter V. The Gas Liquor: Testing Gas Liquor. Treating the Gas Liquor, The Distillation of Gas Liquor, Working the Still, Preparation of Concentrated Gas Liquor, Preparation of Ammonia, Liquefied Ammonia, Sulphate of Ammonia.—Chapter VI. The Treatment of the Gas-Purifying Agents, Eliminating the Sulphur by Extraction, Lixiviating the Purifying Material, Treating the Liquor, Treating the Extracted Material. —Chapter VII. Treating the Cyanogen Sludge.—Chapter VIII. Treating the Crude Liquors: 1. Precipitation with Iron Salts, 2. Precipitation with Ammonium Salts, 3. Precipitation with Potassium Salts.—Chapter IX. The Treatment of Crude Ammonium Thiocyanate and Cuprous Thiocyanate.—Chapter X. Potassium Ferricyanide.—Chapter XI. The Cyanogen Pigments.—Chapter XII. Sulphur and Sulphuric Acid.—Index.

For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine St., New York City

ENGINEERING DIRECTORY

ALFRED E. FORSTALL CHARLES D. ROBISON

FORSTALL & ROBISON

ENGINEERING

In connection with the Design and Construction of Coal Gas Works, Gas Distribution Systems, Electric Light and Power Plants

Advice as to Operation and Rates of Gas and Electric Properties

Investigations and Appraisals for Owners or Financial Institutions

84 William Street, New York City

HENRY I. LEA
CONSULTING GAS ENGINEER
PEOPLES GAS BUILDING
CHICAGO

COAL GAS, WATER GAS, OIL GAS, NATURAL GAS, COKE OVEN GAS, PRODUCER GAS — *PLANT* — *DESIGN, CONSTRUCTION, MANAGEMENT, AUDIT, VALUATION, RATE MAKING*

COMPLETE ENGINEERING AND COMMERCIAL REPORTS COVERING GAS PLANT MATTERS EXCLUSIVELY

H. M. BYLLESBY & COMPANY

(INCORPORATED)

NEW YORK—Trinity Bldg. CHICAGO—Continental and Commercial Bank Bldg. TACOMA—Washington.

PURCHASE, FINANCE, CONSTRUCT and OPERATE ELECTRIC LIGHT, GAS, STREET RAILWAY and WATER POWER PROPERTIES.

EXAMINATIONS AND REPORTS

UTILITY SECURITIES BOUGHT AND SOLD

ROGER W. POLK

Consulting Gas Engineer

Engineering and Commercial Examinations and Reports.

Appraisals for Purposes of Purchase or Sale of Properties, Issuing Securities, and Commission Investigations.

Design and Construction of Complete New Coal and Water Gas Plants and Additions to Existing Plants and Street Main Systems.

193 WASHINGTON AVE., PROVIDENCE, R. I.

WILLIAM E. BARRETT,

CONSULTING GAS ENGINEER.

ARTIFICIAL GAS—NATURAL GAS

DESIGN, CONSTRUCTION, VALUATION, REPORTS.

HIGHEST EFFICIENCY IN OPERATION.

Wall Street Exchange Building,

43-49 EXCHANGE PLACE, - NEW YORK CITY.

WILLIAM A. BAEHR,

CONSULTING ENGINEER,

GAS AND ELECTRIC PLANTS.

Design, Construction and Operation, Valuations and Reports.

PEOPLES GAS BUILDING, CHICAGO.

We TEST LAMPS

Electrical Testing Laboratories

80th St. and East End Ave., New York City

PATENTS—TRADE MARKS—COPYRIGHTS.

ROYAL E. BURNHAM,

Solicitor of Patents and Counsellor in Patent Causes.

883 Bond Building, Washington, D. C.

Send for Pamphlet on Patents.

ALEX. C. HUMPHREYS, President.
ALTEN S. MILLER, Vice-President.

EMILE GUILLAUDEU, Treasurer.
ROBERT O. LUQUEER, Secretary.

HUMPHREYS & MILLER, INC.,

165 Broadway, New York,

CONSULTING ENGINEERS.

ARTIFICIAL GAS,
NATURAL GAS,
ELECTRICITY,

OPERATORS,
CONSTRUCTORS,
APPRAISERS.

CABLE ADDRESS:
WILDOLPH, NEW YORK

WILLIAM W. RANDOLPH, M.E.

233 BROADWAY
NEW YORK CITY

CONSULTING ENGINEER

EXAMINATION AND VALUATION OF PUBLIC UTILITY AND POWER CORPORATIONS.
ADVICE AS TO CONSTRUCTION AND MANAGEMENT

TO FACILITATE HANDLING

ULCO LEAD WOOL

IS PUT UP

IN ROPE FORM

United Lead Company

111 BROADWAY, NEW YORK

Offices in All Principal Cities

Main Laying

Either High or Low Pressure.
We can save money, time and tools for you.

Sullivan Brothers

FLUSHING, N. Y.

PREPAREDNESS

The pamphlets issued by manufacturers advertising in The American Gas Light Journal contain valuable data.

Write for them—read them.

IF you really care about having good, pure gas—about retaining coarse shavings as long as possible—about increasing the number of feet of gas purified per bushel of oxide—then most any oxide will not do. You want a particular oxide for your specific needs.

Naturally oxides differ in proportion to the amount of iron used and size of shavings and hydration. Hence—be certain of getting the best oxide. It is essential that you select one backed by a guarantee.

Iron Hydroxide is backed by a guarantee of ten years' honest business.

IRON HYDROXIDE now used in 268 Gas Works.

IRON HYDROXIDE COMPANY

PASCHALL STATION, PHILADELPHIA, PA.

The Man who has

BLUE STEAM

and

Will always **HOSS SENSE**

"Hook 'er to the Biler,"

Because we give him ABSOLUTE PERFECTION IN ELEVATORS.

"Hot Air!"

"Why, Ridgway, if you had such an elevator everybody would be getting them."

Bless your dear old stay-at-home heart, "DEADIE," everybody is getting them but you.

Look at this bunch for just a sample. We could print 2000 more names if we had the space—or any one cared to read.

Standard Oil Co.	H. J. Heinz Co. "57."	United States Government.
Yale & Towne Mfg. Co.	International Harvester Co.	E. I. Du Pont & Co.
Cluett, Peabody & Co.	John Wanamaker.	General Electric Co
United Gas Imp. Co	Remington Typewriter Co.	Packard Motor Car Co.
National Cash Reg. Co.	Continental Gin Co.	Continental Can Co.
Hammermill Paper Co.	Erie Railroad Co	Solvay Process Co.
Proctor & Gamble Co.	Crane & Co. (Dalton).	John Morrell & Co.

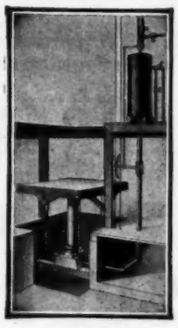
Here is the Ridgway guarantee:

1—Virtually costless to run.
2—Absolutely fool proof.
3—No repairs.
4—Always go at any speed.
5—Goes when the engine shuts down.

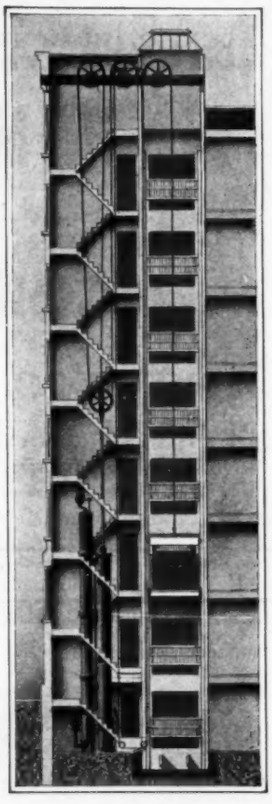
NO PAY UNTIL IT MAKES GOOD.

Think of any man with steam boilers deciding upon his elevator equipment on somebody else's say so without first finding what it means to

"HOOK 'ER TO THE BILER."



THE GAS MAN'S PET.



CRAIG RIDGWAY & SONS, COATESVILLE, PA.

ELEVATOR MAKERS TO FOLKS WHO KNOW.

ROOTS

GAS EXHAUSTERS and GAS PUMPS

For

COKE OVEN WORK

57 YEARS THE STANDARD OF THE WORLD

57 years of experience boiled down, which means the embodiment in these machines of the highest efficiencies, economies and greatest durability. We have in operation Exhausters and Gas Pumps with a daily capacity of 631,504,870 cubic feet for Coke Oven Work and have on order Exhausters and Pumps for a heavy daily output.

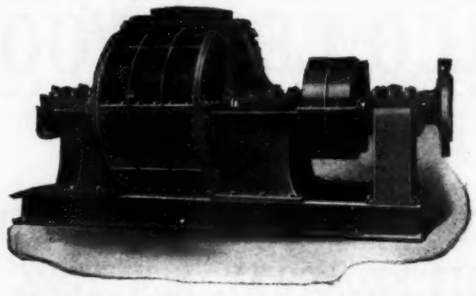
We also make the most efficient, economical and durable Pump for handling straw oil and tar, ever designed.

P. H. & F. M. ROOTS COMPANY

Connersville, Indiana

CHICAGO OFFICE
1245 Marquette Building

NEW YORK OFFICE
120-122 Liberty Street



CONNERSVILLE GAS BOOSTER.

The machine above illustrated is the latest improved type of the high pressure gas pump, and takes front rank in matters of efficiency and serviceability.

Note the six liberal size, ring-oiling bearings, heavy ribs and cylinder and headplates, the rational box-foot design, rigid 1-piece bed-plate, split cylinder and headplates, flexible coupling.

Write for further particulars and quotation stating desired capacity and pressure.

Ask for Catalog

CONNERSVILLE BLOWER COMPANY,
CONNERSVILLE, INDIANA.

BRANCH SALES OFFICES:

929 Monadnock Block, CHICAGO.

114 Liberty Street, NEW YORK.

DEILY & FOWLER MFG. CO.

39 Laurel Street, Philadelphia, Pa.

Established 1842 BUILDERS OF **Incorporated 1908**

GAS HOLDERS

SMALL HOLDER IN STOCK

Absolutely new STEEL TANK HOLDER, 20,000 cubic feet capacity, practically ready for shipment. WRITE FOR PRICES.

OCEAN
WESTMORELAND
GAS
COAL

The uniformity and quality are backed by the service of our organization.

We mine—we ship—we serve.

The Berwind White Coal Mining Company

A. C. M. AZOY

General Agent and Manager
Gas Coal Department.

No. 1 Broadway, New York City,
AND
Commercial Trust Bldg., Philadelphia.

R. D. WOOD & CO.

400 CHESTNUT STREET, PHILADELPHIA

MANUFACTURERS OF

Cast Iron Pipe

HEAVY LOAM CASTINGS

Dunham Specials
Hydraulic Work

LAMP POSTS, VALVES, ETC.

Gas Power Plants with Producers

BUILDERS OF

Gasholders

Single or Multiple Lifts, with or without Metal Tanks

Purifiers, Condensers
Scrubbers, Bench Work

Cutler's Patent Freezing Preventer for Holder Cups

S. Pemberton Hutchinson, President. H. C. Adams, Vice-President. Chas. F. Godshall. 2d Vice-Pres. & Treas. C. B. Nichols, General Sales Agent

THE WESTMORELAND COAL COMPANY

CHARTERED 1854

Mines Situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Pa.

POINTS OF SHIPMENT:

PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J.

Since the commencement of operations by this Company its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

PRINCIPAL OFFICE

224 South Third Street, Philadelphia, Pa.

WE SOLICIT YOUR INQUIRIES FOR EITHER

Silica or Fire Clay Benches

JAMES GARDNER, JR., COMPANY, - - - BOLIVAR, PA.

"CARBURETER"

BRICK ARE MADE EXCLUSIVELY

FOR CHECKER WORK IN WATER GAS MACHINES

Adopted by many of the largest Gas Companies of United States, having proven, after exhaustive comparative tests, to be the most satisfactory and economical.

MANUFACTURED BY UNION MINING CO.

PROPRIETORS OF THE MOUNT SAVAGE FIRE BRICK WORKS

1118-1117 Fidelity Bldg., Baltimore, Md. Mount Savage, Md.

JOHN DELL, *President and General Manager.*

MISSOURI FIRE BRICK CO.,

ESTABLISHED 1882.

MANUFACTURERS OF

Gas Retorts, Bench Settings, Fire Brick, Cupola Linings, Etc.

We are the **Exclusive Agents** *for the* **Mitchell Patent Benches,** *Constructed with Half or Full Depth Furnaces, to Burn either Coal or Coke, and Arranged for Front or* **Rear Clinkering.** **The Mitchell** *is the* **Original Coal Firing Bench.** *We also Erect Plain Benches with* **One** *to* **Six Retorts.**

City Office: *411 Olive Street, Continental Bank,* ST. LOUIS, MO.

YOUR CORRESPONDENCE IS RESPECTFULLY SOLICITED.

GEROULD'S IMPROVED RETORT CEMENT

The Old Reliable

A cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

Price List, f.o.b. THOMPSON, CONN.

In Casks, 400 to 800 pounds, at 5 cents per pound.
In Kegs 100 to 200 " " 6 " "
In Kegs less than 100 " " 7 " "

C. L. GEROULD, THOMPSON, CONN.

RUSSELL ENGINEERING COMPANY

FORMERLY

D. R. Russell Engineering and Development Company

SAINT LOUIS, MO.

COAL GAS BENCHES

COMPLETE COAL CARBONIZATION PLANTS

National Commercial Gas Association meets in Atlantic City, N. J., November 13 to 18. Make plans now for yourself and employees to attend.

"Kinetic-6" 6-Mantle "Kinetic-3" 3-Mantle

"KINETIC-3" and "KINETIC-6"

TWO OUTDOOR GAS LAMPS WITH THE COMMANDING ADVANTAGES OF THE WELSBACH KINETIC PRINCIPLE BURNER

Through its performance in the "C. E-Z" Light and Welsbach Kinetic Gas Bowls, the kinetic principle burner has proven itself to be a genuine stroke of fortune for the gas lighting industry. This Welsbach burner principle has come to be a fundamental of artificial illumination; a basic factor in selling gas lighting.

The kinetic principle has the same advantages for outdoor lighting that it has for indoor requirements. Because of it, efficiency and candle-power are very high in these two new lamps. The work and cost of maintenance are greatly reduced.

Single burner tube and single adjustment for all the mantles. Durable and weather-proof shells, no perforations for working parts. Nothing inside the shell the fitter needs to get at. The gas adjustment made without opening lamp. Filter pilot body. Two sizes, three-mantle and six-mantle.

Now ready. Get your order in early.

Welsbach Company

Gloucester New Jersey

BROWN'S DIRECTORY
FOR 1916 NOW READY
PRICE, $5

For Sale by

American Gas Light Journal

42 Pine Street, - - - - - - New York City

ONE OF TWO TEN MILLION (10,000,000) CUBIC FEET CAPACITY

GAS HOLDERS

BUILT BY

THE BARTLETT HAYWARD CO.

BALTIMORE NEW YORK

Riter-Conley Manufacturing Company

STEEL CONSTRUCTION

Pittsburgh

HELME & McILHENNY

1339-1349 Cherry St., Philadelphia, Pa.

ESTAB. 1848 H & McI

GAS METERS

HINMAN DRUM STATION METERS, FOULIS GAS GOVERNORS
PREPAYMENT METERS

REPAIRING AND CONVERTING

PROMPT SHIPMENTS - - - - CORRESPONDENCE SOLICITED.

Mid-Year Conference Educational Papers.

HOME TALENT OFTEN NEGLECTED.

By J. M. Brock.

I have seen managements bring men from the outside, find berths for a contingent from the annual exodus of their alma mater, take assiduous care of proteges of the directors, pay more attention to the bonds of a college fraternity than to years of service. Such managements show consideration to anyone but the men entitled to it, who have given the best efforts of their heads and hands. As a consequence, the men who would not be underlings to inferior intelligence and heckling officialism, or be passive under undeserved pettishness, resign at the first favorable opportunity; others assume an apathetic attitude and plug ahead just as long as their monthly envelopes come regularly.

Of what avail is it to originate a labor saving device, or to develope a more efficient system of selling when your superior has had no experience in the matter, and therefore has no standards of comparison? Your good work does not matter, as you are rated by your worst output and some other man takes credit for all the satisfactory results.

The ambitious ask themselves, What incentive does the company offer me to outstrip my fellow-workman? What are the qualifications for promotion? Must there be a friend at court to stimulate every trifling concession?

Now, in the name of common sense, let us have equitable administration, with favoritism toward none; promotion on merit tempered with seniority, so ours may offer inducements on a par with the best industries; so that fathers will raise their sons to share in its possibilities, so that we, the workers, can realize our aspirations.

It is a popular fallacy, propagated by corporations and cherished by credulous employees, that the most competent men are chosen for the higher positions, that merit will receive its just reward, that long and faithful service will not go unappreciated. Assuredly these trite phrases express the ethical considerations for promotion, the evident duty and moral obligation of the company to the individual; and no less assuredly if they were adhered to, less friction would ensue and less bitter feeling would be engendered between labor and capital. A scrutiny, however, of the personnel of some managements will show a wanton disregard for all of this, when applied to advancement in any but minor positions.

The business of selling gas is no recreation; it cannot be learned at spare moments, pursued when we have nothing better to do, nor assimilated during a few months' casual observation. It has no connection with bridge parties or golf links, is no relief for the ennui of society; it cannot be absorbed wholly from books, nor undertaken half-heartedly.

When a company's policy—or lack of policy—permits the habitual introduction of men from beyond its confines to fill the higher vacancies occuring in the natural order of events, it implies the inferiority of its existing force, it discounts the consideration due length of service; for everyone must start anew with the alien appointee, the worker and the idler meet him on an equal footing.

The acquisition of some salient ability or peculiar excellence will of course silence criticism and mollify any feeling of resentment from subordinates, but when the incumbent possesses neither experience nor aptitude, nothing to recommend him but influence, nothing to warrant his retention but the decree of an arrogant management, ambition is silly, *esprit de corps* mere twaddle, organization and respect for authority absurdities.

THE ILLUMINATION COURSE AND THE GAS COMPANY EMPLOYEE.

By James D. Lee, Jr.

Of the educational courses prepared for the N. C. G. A., no one in particular is more essential to the gas industry at the present time than that on illumination. To retain its position in the lighting field is to keep open the paths already worn smooth through repeated introductions of new uses for gas.

A knowledge of illumination is essential to the progress of gas lighting. What progress would gas lighting make if the practices of former years were continued and sound principles of illumination ignored? Would the obsolete methods of installation endure for long against the highly developed thought given to lighting to-day. It is unthinkable that an industry deriving possibly 50 per cent. of its revenue from lighting should leave so important a part of its work to improperly trained men. The demand for men specially trained in matters of illumination was never more vital to the gas industry than at this stage of its development.

The history of the gas industry is inseparably connected with its lighting. The gas industry has been built on its merits as an economic necessity and this feature is more specially true as regards lighting than anything it has ever attempted or may ever hope to accomplish. Gas lighting established the industry on a solid basis and none of its later undertakings may ever hope to fill the position it once occupied when in years past gas lighting proved such a boon to civilization. When later it seemed shaken from its position, through the development of the electric incandescent lamp and the perfecting of the system of distribution of electricity, the introduction of the Bunsen burner and Welsbach mantle was sufficient to retrieve the place gas lighting had all but lost, and its value was again demonstrated.

To-day, we witness the attack the highly-developed and well-trained organization of the electric industry is directing against this branch of our business. The greater necessity for economy demanded by electric lighting developed to a high degree that branch of engineering which has to deal with the control of light. In the matter of utilization as well as production of light, the utmost effort has been expended. In fact, much of the convenience often attributed to an inherent quality of electric lighting is the result of intelligent thought and painstaking effort on the part of the electrical engineer responsible for the installation. The highly specialized training required to handle well the work in illumination is sufficient reason for every gas man being required to take the course prepared by the Association.

The public has a right to expect that the information it receives from a gas company employee is based on facts. The responsibility does not end here—the value of the gas company's service is measured in the ability of its representatives to improve the lighting conditions of its customers. The representative must first realize the responsibility of his undertaking before he can be ready to suggest a solution to the problem confronting him. He must be familiar with good lighting practice to suggest improvements. The concrete examples of successful installations must be analyzed intelligently if he is to impress his prospect with the value of a particular illuminant in a certain case. He may quote from authority the facts regarding gas lighting with which he himself has been impressed, but he must have the ability to question the statements of his competitor that refute his arguments. He must be trained in the fundamentals of good lighting to distinguish the essential difference between the value of the one and the shortcomings of the other. He must be prepared to offer more than just an argument—he must have evidence to prove each vital statement he makes and must become familiar with the sources of information and get his knowledge from a well chosen authority. A knowledge of competitive illuminants is essential to a full appreciation of the value of gas lighting.

How is the gas company employee going to acquire all this information?

The N. C. G. A. course as outlined covers just those essential features that lead to a better appreciation of the value of good lighting. It is in the effort to make gas lighting good lighting that every gas man should be interested. The information contained in the illumination course will enable him to suggest a solution to the problems confronting him. Professor Richtmyer in a paper before the Illuminating Engineering Society on the educational aspects of Illuminating Engineering says regarding the courses of study:

"As the practicing engineer became more and more of a specialist, it was recognized that his training should be more and more fundamental and as a consequence we note a tendency to increase the amount of time in the study of mathematics, chemistry, physics, and general engineering, and correspondingly to decrease the amount of instruction given in what we might call technological specialization, etc."

It is interesting to those who have taken the course thus far prepared to note how fully the ground work has been covered in these fundamentals.

In conclusion it might be said that there can be no better way of developing the possibilities of gas lighting than by studying the illumination course.

POSITIONS--BUSINESS OPPORTUNITIES

The rate for special advertisements printed on this page is **$1.50** per inch in depth of column each insertion.

FINANCIAL NOTICES.

DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS. PHILADELPHIA, June 14, 1916

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable July 15, 1916, to stockholders of record at the close of business, June 30, 1916. Checks will be mailed.

3041-4 I. W. MORRIS, Treasurer.

POSITIONS WANTED.

As COMMERCIAL MANAGER Open after June 1st. Ten years' experience. Gas and electric company preferred.

Address, "BOX 9,"

3036-7 Care this Journal.

Experienced young man desires position as COMMERCIAL MANAGER with gas company. Could manage small or medium sized property. Address, "H.,"

3040-3 Care this Journal.

As SUPERINTENDENT, by young man with 11 years' experience in the manufacture of water gas and low pressure system of distribution. Temperate and hard working. Can accept at once.

3042-1 Address, "RESULTS," care this Journal.

As MANAGER of gas-electric, heating or water company, by an engineer and manager of exceptional experience and with a fine record. Can handle all kinds of work quickly and properly. If you want an aggressive and thoroughly qualified man,

3042-3 Address, "BOX 20," care this Journal.

POSITIONS OPEN.

Wanted, a good, sober, reliable STOKER for small gas plant in Northern Michigan. Thirty cents an hour for eight-hour shift

Address, "NORTHERN MICHIGAN,"

3041-2 Care this Journal.

MISCELLANEOUS.

FOR SALE,

A one-lift steel tank holder, 36,000 cu. ft. capacity. Specifications mailed on application.

CENTRAL HUDSON GAS & ELECTRIC CO.,

3040-4 POUGHKEEPSIE, N. Y.

FOR SALE,

One five-foot set U. G. I. Lowe Water Gas Apparatus. Can make immediate delivery.

Address,

TORRINGTON ELECTRIC LIGHT CO.,

3041-3 TORRINGTON, CONN.

Wanted, Second-Hand METER PROVER, 5-foot capacity.

Address,

NATICK GAS LIGHT CO.,

3042-1 NATICK, MASS.

Utilize Your Gas Liquor.

NO EXTRA LABOR OR OPERATING EXPENSES.

IMPROVED AMMONIA CONCENTRATOR.

About 130 in use. Write to

STROH & OSIUS, Patentees, or

MICHIGAN AMMONIA WORKS, - Detroit, Mich.

Established 1856

HENRY MAURER & SON

Manufacturers of

High Grade Firebrick, Blocks, Tiles, Etc.

Works: Maurer, N. J. Office: 420 E. 23d St., N.Y. City

KELLER ADJUSTABLE COKE CRUSHER.

Strong, Simple, Durable. Will Crush any Size Desired.

C. M. KELLER,

Columbus, Ind.

Correspondence Solicited.

The JOURNAL

on your desk is a mark of distinction. Its Editorials, Items of Interest and selected articles are such as will be of help to the busy gas man.

We give the news FIRST.

Published weekly.

Three dollars a year.

Less than 6 cents a week.

Governors that have thirty years' practical experience behind them. They govern 75% of the manufactured gas distributed in this country. We build them for every size, pressure and capacity. The following Bulletins describe our Gas Works Apparatus and Equipment. All of these contain valuable information. If you have not received them all, send for those missing. Please mention any special information required, on any of these or other subjects:

No. 1—Gas Governors, including low and high pressure station and district units.
No. 1A—Retort House Governors.
No. 1B—Fuel Gas (Coke Oven) Governors.
No. 2—Iron Sponge—includes water and coal gas purifying material.
No. 3—Revivifying in Situ—tells how to reduce purifying costs.
No. 4—Unison Telemetric Pressure Gauge—includes height of holder indicator.
No. 5—Utilizing Tar for Fuel—including gas-tar separators and burners.
No. 6—Exhausters and Boosters.
No. 7—Gas Testers—including gravity Sulphur Naphthalene, Calorimeter Analysis.
No. 8—Photometers (Jet).
No. 9—Low Pressure Service Regulation.
No. 9A—Sterling Low Pressure Governor.
No. 10—High Pressure Service Regulation—including Lockwood Safety Valve.
No. 11—Respirating and First Aid Outfits—including helmets and resuscitation equipment.
No. 12—Monarch Storage Battery Lamps—including meter-reading lamps, trouble lamps and trench lamps.
No. 12A—Monarch Hand Lamps—includes unbreakable storage batteries.
No. 13—Universal Safety Lamps (like miners' lanterns).
No. 14A—Pressure Gauges—includes syphon or "U" gauges, pocket gauges, differential gauges.
No. 15—Thermometers, Barometers and Pyrometers.
No. 16—Tools and Street Dept. Requisites.
No. 17A—Connelly Back Pressure Valve.
No. 18—Sterling Semi-High Pressure Governor.
No. 19 Connelly Automatic Electric Drip Alarm.
No. 20—Connelly Liquid Seal District Governor

Connelly Iron Sponge and Governor Co.

New York, Chicago

U.S.A.

The FULTON HOUSE SERVICE REGULATOR

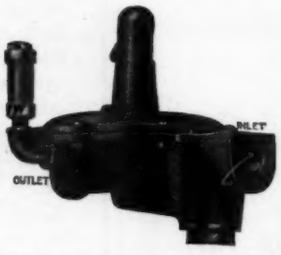
(Spring Style)

The Valve in this regulation is opened by a spring instead of lever and weight.

It is strongly and durably made. The spring can be adjusted to deliver a given pressure and the spring-case can be locked and sealed.

It will reduce any intake pressure up to 100 pounds to a delivery pressure of a few ounces; size from ¾-inch inlet and outlet to 1½-inch inlet and outlet.

This FULTON SENSITIVE GOVERNOR is for high pressure service lines connecting users directly with the high pressure mains.



It will control any high pressure on the inlet side up to 100 pounds and deliver any desired outlet pressure from 2 inches water to 6 ounces.

IT WILL HANDLE ANY FORM OF MANUFACTURED GAS

Our thirty years of gas regulator experience is always at the service of our customers.

Illustrated Catalog, showing all styles, on request.

The Chaplin-Fulton Mfg. Co.
Pittsburgh, Penna.

ALPHABETICAL LIST OF ADVERTISERS

Advertisements received up to 10 A.M., Tuesday, will appear in issue of the following Monday.

American Gas Furnace Co. 24
American Meter Co. 30

Baehr, Wm. A. 10
Barrett, William E. 10
Bartlett-Hayward Co. 16
Beaumont Co., R. H. 21
Berwind-White Coal Mining Co. 13
Bower, Henry, Chemical Mfg. Co. 9
Brown Instrument Co. ..... —
Burnham, R. E. 10
Bylesby & Co., H. M. 10

Chaplin-Fulton Mfg. Co. 20
Chemical Service Laboratories 8
Connelly Iron Sponge & Governor Co. 19
Connersville Blower Co 12
Crane, Wm. M. ..... —
Cruse-Kemper Co. 5

Davis & Farnum Mfg. Co. 6
Deily & Fowler Mfg. Co. 13
Dickey & Co., C. H. 27
Didier-March Co. 20
Dixon Crucible Co., Jos. 22
Donaldson Iron Co. 21

Electrical Testing Laboratories 10
Equitable Meter Co. 30

Forstall & Robison 10
Fritchman, W. H. ..... —

Gardner, Jr., Co., James 14
Gas Engineering Co. 7
Gas Machinery Co. 3
Gautier & Co., J. H. 8
General Gas Light Co. ..... —
Gerould, C. L. 14
Griffin & Co., John J. ..... —

Heime & McIlhenny 17
Humphreys & Miller 11

Improved Equipment Co. 9
Iron Hydroxide Co. 11
Isbell-Porter Co. 6

Keller, C. M. 19
Kerr Murray Co. 24
Keystone Meter Co. 31
Koppers Co., H. 2

Lea, Henry L. 10
Ludlow Valve Mfg. Co. 6

Maurer & Son, H. 19
McDonald & Co., D. 31
Mead-Morrison Mfg. Co. ..... —
Michigan Ammonia Works 9
Miner, Thos. T. W. 26
Missouri Firebrick Co 14

New York Lead Wool Co. 8

Parker-Russell Mining & Mfg. Co. 8
Pennsylvania Globe Gas Light Co. 25
Pittsburgh Meter Co. 31
Polk, Roger W. 10

Randolph, W. W. 11
Reynolds Gas Regulator Co. 23
Ridgway & Sons, Craig 12
Riter-Conley Mfg. Co. 17
Roots Co., P. H. & F. M. 12
Russell Engineering Co. 14

Safety Gas Main Stopper Co. 12
Sprague Meter Co. 30
Stacey Bros. Gas Construction Co. ..... —
Stacey Mfg. Co. 4
Sullivan Bros. 11

Tufts Meter Co., Nathaniel 27

Union Mining Co. 14
United Gas Improvement Co. 3
United Lead Co. 11

Welsbach Co. 15
Welsbach Street Lighting Co. 7
Western Gas Construction Co. 32
Westmoreland Coal Co. 14
Wiederhold Mantle and Burner Co. 26
Wood & Co., R. D. 13

LABOR IS SCARCE—*SAVE IT*
BREEZE IS WASTEFUL—*REDUCE IT*
SOGGY COKE IS UNSALABLE—*QUENCH IT PROPERLY*
RUN-OF-OVEN COKE IS DIFFICULT TO SELL—*SIZE IT*

DE BROUWER CONVEYOR AT RACINE.
We installed the complete conveying and screening system, including concrete bunker.

Catalog No. 30 will show you how.
It is an encyclopedia of all modern systems.

CONVEYING
HOISTING
QUENCHING
SCREENING
CRUSHING

Write for it to-day.

R. H. BEAUMONT CO.
1039 Drexel Building
PHILADELPHIA

ASSOCIATION MEETINGS

CANADIAN.
Annual Meeting—Quebec, August 16 and 17, 1916.
President, R. A. Wallace, Quebec.
Secretary-Treasurer, Geo. W. Allen, Toronto Gas Company.

PACIFIC COAST.
Annual Meeting—Santa Barbara, Cal., September, 1916.
President, F. A. Cressy, Jr., Modesto, Cal.
Secretary-Treasurer, H. Bostwick, 445 Sutter St., San Francisco.

MICHIGAN.
Annual Meeting—Detroit, September, 1916.
President, B. R. Laraway, Jackson.
Secretary-Treasurer, C. R. Graves, Lansing.

AMERICAN GAS INSTITUTE.
Annual Meeting—Chicago, October 17, 18, 19 and 20, 1916.
President W. E. McKay, Boston.
Secretary, George G. Ramsdell, 29 West 39th St., New York City.

EMPIRE STATE.
Annual Meeting—New York City, October, 1916.
President, J. C. De Long, Syracuse, N. Y.
Secretary, C. H. B. Chapin, 29 West 39th Street, New York City.

NATIONAL COMMERCIAL.
Annual Meeting—Atlantic City, N. J., November 13 to 18, 1916.
President, Jansen Haines, Des Moines, Ia.
Secretary, Louis Stotz, 61 Broadway, New York City.

SOCIETY OF GAS LIGHTING.
Annual Meeting—New York City, December 6, 1916.
President, Fred S. Benson.
Secretary, George G. Ramsdell, 29 West 39th St., New York City.

NEW ENGLAND.
Annual Meeting—Boston, Mass., February, 1917.
President, H. C. Crafts, Pittsfield, Mass.
Secretary, N. W. Gifford, East Boston, Mass.

GUILD OF GAS MANAGERS.
Annual Meeting—Young's Hotel, Boston, Mass., March, 1917.
Monthly Meeting—Second Saturday.
President, S. J. Fowler.
Secretary, H. K. Morrison, Lynn, Mass.

WISCONSIN.
Annual Meeting—Milwaukee, March 15-16, 1917.
President, F. L. Cross, Madison, Wis.
Secretary-Treasurer, Henry Harman, Milwaukee, Wis.

ILLINOIS.
Annual Meeting—Chicago, March 21 and 22, 1917.
President, C. W. Bradley, Chicago, Ills.
Sec'y-Treasurer, Horace H. Clark, 72 W. Adams St., Chicago, Ill.

SOUTHERN.
Annual Meeting—Roanoke, Va., April ———, 1917.
President, Rosco Nettles, Tampa, Fla.
Secretary-Treasurer, E. D. Brewer, 45 Poplar Circle, Atlanta, Ga.

PENNSYLVANIA.
Annual Meeting—Reading, Pa., April ———, 1917.
President, F. P. Duggan, Lewistown, Pa.
Secretary-Treasurer, L. R. Dutton, Wyncote, Pa.

NEW JERSEY.
Semi-Annual Meeting—
President, S. J. Franklin, Millville, N. J.
Secretary-Treasurer, O. F. Potter, Newark, N. J.

INDIANA.
Annual Meeting—Indianapolis, April ———, 1917.
President, A. M. Dolley, Logansport.
Secretary-Treasurer, J. W. Dunbar, New Albany.

IOWA DISTRICT.
Annual Meeting ——— **May** ——— 1917.
President, G. I. Vincent, Des Moines, Ia.
Secretary, T. B. Genay, Des Moines, Ia.

NATURAL GAS.
Annual Meeting—Buffalo, N. Y., May, 1917.
President, J. F. Guffey, Pittsburgh, Pa.
Secretary-Treasurer, T. Clive Jones, Delaware, O.

GAS METERS.
Monthly Meetings—Grand Commissioner, F. H. Hutchinson, care East Ohio Gas Co., Cleveland, O. General Secretary, J. M. Brock, 538 Dean Street, Brooklyn, N. Y.
New York Section—Chairman, A. C. Johnson. Secretary, E. J. Jacob, 84 Sip Avenue, Jersey City, N. J.
Cleveland Section—Chairman, E. E. Wagner. Secretary, Roy Cochran, 1147 East 6th Street, Cleveland, O.
Philadelphia Section—Chairman, R. J. Ralston. Secretary, W. G. Murfit, U. G. I. Co., 134 North 13th Street.
New England Section—Chairman, E. B. Mooney. Secretary, A. F. Pettingill, Cambridge, Mass.
Akron, O., Section—Chairman, L. B. Terry. Secretary, W. A. Strauss, East Ohio Gas Company, Akron, O.

ILLUMINATING ENGINEERING.
Annual Meeting—Phila., Pa., September 18-20, 1916. President, Dr Chas. P. Steinmetz. General Secretary, C. A. Littlefield.
Chicago Section—Chairman, E. W. Lloyd. Sec'y, O. L. Johnson.
New York Section—Chairman, D. McF. Moore. Secretary, N. D. Macdonald.
New England Section—Chairman, Louis Bell. Sec'y, S. C. Rogers.
Pittsburg Section—Chairman, L. J. Kiefer. Sec'y, R. H. Kinner.
Philadelphia Section—Chairman, G. S. Crampton. Sec'y, R. B. Ely.

CONSIDER the cost of labor in any painting job as against the price of paint. Make up your mind that a more durable paint like

DIXON'S SILICA GRAPHITE PAINT

lengthens the intervals between repainting and saves in the cost of labor. Booklet No. 231-B upon request.
For exposed metal surfaces of all kinds.

Made in JERSEY CITY, N. J., by the
JOSEPH DIXON CRUCIBLE COMPANY
Established 1827

AGENTS
Pacific Coast—VAN E. BRITTON, 269 Monadnock Bldg., San Francisco, Cal.
Great Britain—PARKER & LESTER, Ormside St., Old Kent Road, London, S. E.

GOODMAN STOPPER
The Half Minute
GAS MAIN SHUT-OFF
Manufactured and Sold by Safety Gas Main Stopper Co. 257-263 E. 133d St., New York

GEORGE ORMROD, Pres. & Treas. JOHN D. ORMROD, Vice-Pres. & Supt. J. G. EBERLEIN, Secretary.
EMAUS PIPE FOUNDRY
CAST IRON GAS & WATER PIPE
DONALDSON IRON CO.
EMAUS, PA.
Manufacturers of CAST IRON PIPE AND SPECIAL CASTINGS FOR WATER AND GAS, also FLANGE PIPE and FITTINGS for same.

COX'S LOW PRESSURE COMPUTER, Price, $2.50
COX'S HIGH PRESSURE COMPUTER, " 5.00
For Sale by AMERICAN GAS LIGHT JOURNAL
42 Pine St., New York City

APPLICATION

The pamphlets issued by manufacturers advertising in The American Gas Light Journal contain valuable data.

Write for them—read them.

What Advertisers Offer to Readers

Classified Index of Products of Representative Manufacturers and Dealers Advertising in this Issue.

See Index page 20 for Manufacturers' Advertisements of Products Listed here.

Ammonia Concentrators.

Bartlett-Hayward Co.
Gas Machinery Co.
Kerr Murray Co.
Michigan Ammonia Works.
Western Gas Construction Co.

Apparatus.

See Coal Gas Plants.
Conveyors.
Stoking Machinery.
Water Gas Plants.

Arc Lamps.

See Lamps.

Bags—Gas.

American Meter Co.
See also Stoppers.

Benches—Complete.

Davis & Farnum Mfg. Co.
Didier-March Co.
Gardner, Jr., Co., James.
Gas Machinery Co.
Gautier & Co., J. H.
Improved Equipment Co.
Isbell-Porter Co.
Missouri Firebrick Co.
Parker-Russell Mining and Mfg. Co.
Russell Engineering Co.
Stacey Brothers Gas Construction Co.

Benzol.

Iron Hydroxide Co.
Western Gas Construction Co.

Blast Furnaces.

American Gas Furnace Co.

Blowers. See Exhausters.

Boiler Graphite.

Dixon Crucible Co., Joseph.

Books.

American Gas Light Journal.

Burners, Fuel.

American Gas Furnace Co.
Crane Co., Wm. M.
Equitable Meter Co.

Burners. See Lamps.

Crane Co., Wm. M.

By-Product Plants.

Koppers Co., H.
Western Gas Construction Co.

Caliking Tools.

New York Lead Wool Co.
United Lead Co

Calorimeters.

American Meter Co.

Carbonic Acid Extractors.

See Purifiers, Scrubbers.

Castings.

See Iron Work. Pipe.

Cements.

Gautier & Co., J. H.
Gerould, C. L.

Chamber Ovens.

Stacey Brothers Gas Construction Co.

Charging Machinery.

Davis & Farnum Mfg. Co.
Isbell-Porter Co.
Stacey Manufacturing Co., The.

Coals.

Berwind-White Coal Mining Co.
Westmoreland Coal Co.

Coal Gas Apparatus.

Bartlett-Hayward Co.
Davis & Farnum Mfg. Co.
Gas Engineering Co.
Gas Machinery Co.
Improved Equipment Co.
Kerr Murray Co.
Riter-Conley Mfg. Co.
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The.
United Gas Improvement Co.
Western Gas Construction Co.

Coal and Coke Handling Machinery.

Beaumont Co., R. H.
Mead-Morrison Mfg. Co.

Cocks—Lamp.

American Meter Co.
Crane Co., Wm. M.

Cocks—Meter and Service.

American Meter Co.

Concrete Piling.

Simplex Concrete Piling Co.

Cookers. See Ranges.

Coke Crushers.

Bartlett-Hayward Co.
Beaumont Co., R. H.
Keller, C. M.

Coke Ovens. Koppers Co., H.

Condensers. See Purifiers.

Conveyors.

Bartlett-Hayward Co.
Beaumont Co., R. H.
Davis & Farnum Mfg. Co.
Gas Engineering Co.
Gas Machinery Co.
Kerr Murray Co.
Mead-Morrison Mfg. Co.
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The.
Western Gas Construction Co.

Elevators.

Craig Ridgway & Sons.

Engineers—Consulting.

Bacbr, W. A.
Barrett, William E.
Bylesby & Co., H. M.
Electrical Testing Laboratories.
Forstall & Robison.
Humphreys & Miller.
Improved Equipment Co.
Lea, Henry I.
Polk, Roger W.
Randolph, Wm. W.

Engineers Contracting.

Barrett, William E.
Bartlett-Hayward Co.
Beaumont Co., R. H.
Cruse-Kemper Co.
Davis & Farnum Mfg. Co
Didier-March Co.
Forstall & Robison
Gas Engineering Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
Kerr Murray Co.
Mead Morrison Mfg Co.
Polk, Roger W.
Riter Conley Mfg. Co.
Russell Engineering Co.
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The
Sullivan Brothers.
United Gas Improvement Co.
Western Gas Construction Co.

Enrichers.

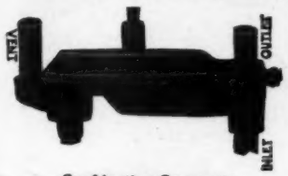
See Oil.

Exhausters.

American Gas Furnace Co.
Connersville Blower Co.
Davis & Farnum Mfg. Co
Gas Engineering Co.
Gas Machinery Co.
Isbell-Porter Co.
Kerr Murray Co.
Roots Co., P. H. & F. M.
Western Gas Construction Co.

REYNOLDS GOVERNORS

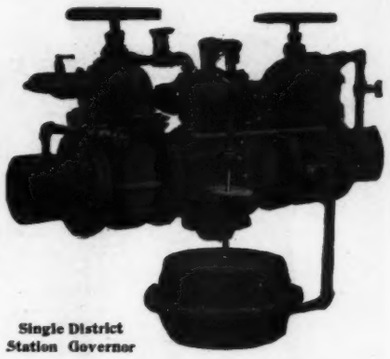
We make anything desired in the GAS GOVERNOR or REGULATOR to meet any and all classes of reductions. Stations for DISTRICT SERVICE, INDIVIDUAL HIGH PRESSURE GOVERNORS for reducing high pressure gas to inches of water. Holder and Low Pressure Service Governors. A steady, uniform pressure can be obtained by using REYNOLDS GOVERNORS, "THE WORLD'S STANDARD." We make a specialty of the Governor business, devoting our entire time to the manufacture of same. All Governors are GUARANTEED.



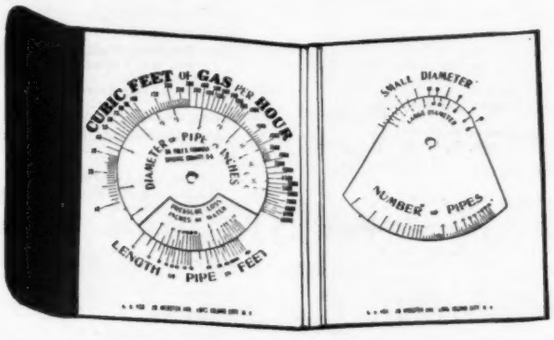
Combination Governor
Governor and Mercury Seal

REYNOLD'S GAS REGULATOR COMPANY
ANDERSON, INDIANA. U. S. A.

Write for instructive Catalog



Single District
Station Governor



Fox Gas Flow Computer

For Superintendents, Salesmen, Foremen and Fitters

TO DETERMINE THE PROPER SIZE OF PIPE TO SPECIFY OR INSTALL AS RUNNING LINES, SERVICES, AND FOR CONNECTIONS TO APPLIANCES AND METERS.

The "Gas Flow" Computer on the left of the folder has the following ranges:

Cu. ft. of gas per hour, from 10 to 10,000 cu. ft.
Diameter of pipe, ... from ⅜ to 6 inches.
Length of pipe, ... from 10 to 1,000 feet.
Pressure loss, ... from 0.01 to 1 in. water.
Specific Gravity—0.6.

The Computer on right of the folder affords a rapid means of determining the number of pipes that can be taken from one of a larger diameter, and have an equivalent capacity. It also can be used to determine the size of pipe necessary to supply a number of small pipes of the same, or varied diameters. It may be used to design headers for meters and appliances, when the distances between the outlets are small enough to make the loss of pressure negligible.

The Computer is issued in pocket size, mounted in a neatly bound folder, measuring 4½ inches by 6 inches, containing an insert page of directions.

Price, $1 each. For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine Street, New York City

ANNUAL MEETING
AMERICAN GAS INSTITUTE
CHICAGO, ILL.
OCTOBER 17, 18, 19, 20, 1916

Continuous Heating Machine, No. 29.

CONTINUOUS HEATING MACHINES

Are GAS FURNACES provided with carriers or propelling machinery for the automatic transmission of work through heated space.

Made in many sizes and styles to meet the various requirements.

We specialize in the use of GAS for mechanical Heat-Treating Operations.

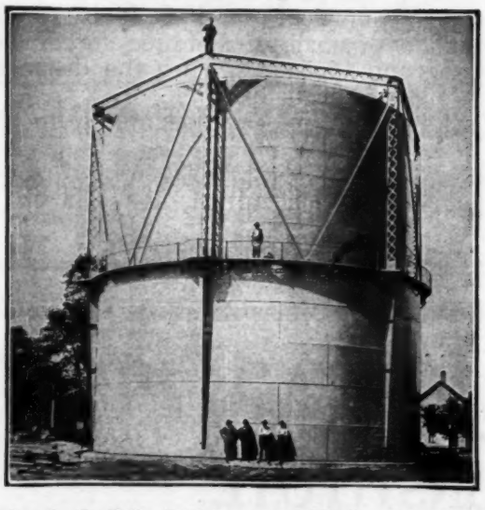
American Gas Furnace Co.

Gas Engineers and Manufacturers

24 John Street New York City

THE KERR MURRAY CO.

A. D. CRESSLER, President.



60,000 Capacity Gas Holder, Built June, 1914, for the Iowa Gas and Electric Co., Washington, Iowa, by

THE KERR MURRAY COMPANY

Gas Works Machinery & Gas Holders

Peoples Gas Building

CHICAGO

What Advertisers Offer to Readers

See Index page 20 for Manufacturerss' Advertisements of Products Listed here.

Firebrick.

Didier-March Co.
Gardner, Jr., Co., James.
Gas Machinery Co.
Gautier & Co., J. H.
Improved Equipment Co
Maurer & Son, Henry.
Missouri Firebrick Co.
Parker Russell Mining and Mfg. Co
Union Mining Co.

Fittings. See Pipe.

Fixtures.

Welsbach Co.

Furnaces—Gas. See Industrial Fuel.

Gas Irons.

Crane Co., Wm. M.

Gas Plants, Complete.

Davis & Farnum Mfg. Co.
Russell Engineering Co.
Stacey Brothers Gas Construction Co.
Western Gas Construction Co.

Gas Pumps and Boosters.

Connersville Blower Co.
P. H. & F. M. Roots Co.

Gas Stoves.

Crane Co., Wm. M.

Gauges Pressure Recording.

American Meter Co.
Brown Instrument Co.
Connelly Iron Sponge and Governor Co
Equitable Meter Co.
Helme & McIlhenny.
McDonald & Co., D.

Governors.

Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge and Governor Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Helme & McIlhenny.
Isbell-Porter Co.
Kerr Murray Co.
Pittsburgh Meter Co.
Reynolds Gas Regulator Co.
Sprague Meter Co.
Western Gas Construction Co

Heaters. See Ranges Water Heaters.

Heating Machines.

American Gas Furnace Co.

High Pressure Goods.

American Gas Furnace Co.
Pennsylvania Globe Gas Light Co.
See Governors.

Holders.

Bartlett-Hayward Co.
Cruse-Kemper Co.
Davis & Farnum Mfg. Co
Deily & Fowler Mfg. Co.
Gas Engineering Co
Kerr Murray Co.
Riter-Conley Mfg. Co
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The.
Western Gas Construction Co.
Wood & Co., R. D.

Hydrogen Gas Apparatus.

Gas Engineering Co.
Improved Equipment Co.
Western Gas Construction Co.

Industrial Fuel Appliances.

American Gas Furnace Co.

Instruments—Recording.

American Meter Co.
Brown Instrument Co.
Connelly Iron Sponge and Governor Co.
Equitable Meter Co.

Iron Work.

Cruse-Kemper Co.
Davis & Farnum Mfg. Co.
Gas Machinery Co.
Gas Engineering Co.
Kerr Murray Co.
Riter-Conley Mfg. Co.
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The.
Western Gas Construction Co.
Wood & Co., R. D.

Laboratories.

Chemical Service Laboratories.
Electrical Testing Laboratories

Lamps.

Crane Co., Wm. M.
General Gas Light Co.
Miner, Thos. T. W.
Pennsylvania Globe Gas Light Co.
Welsbach Co.
Welsbach Street Lighting Co

Lamp Posts.

Donaldson Iron Co.
General Gas Light Co.
Miner, Thos. T. W.
Pennsylvania Globe Gas Light Co.
Welsbach Street Lighting Co.
Western Gas Construction Co.
Wood & Co., R. D.

Lantern—Safety.

Connelly Iron Sponge and Governor Co

Lead.

New York Lead Wool Co.
United Lead Co.

Machinery.

See Charging Machinery.
Coal Gas Apparatus.
Conveyors.
Water Gas Apparatus.

Mains. Sullivan Bros.
See Compressors. Pipe. Lead.

Mantles.

General Gas Light Co.
Wiederhold Mantle and Burner Co
Welsbach Co.

Meters—Acetylene

Equitable Meter Co.
Keystone Meter Co.
Pittsburgh Meter Co.
Sprague Meter Co.

Meters—Air.

Equitable Meter Co.
Pittsburgh Meter Co.
United Gas Improvement Co.

Meter Locks. See Prepayment.

Meters—Natural Gas.

Equitable Meter Co.
Keystone Meter Co.
Pittsburg Meter Co.
Sprague Meter Co.

Meters—Prepayment.

American Meter Co.
Dickey & Co., C. H.
Equitable Meter Co
Griffin & Co., John J.
Helme & McIlhenny.
Keystone Meter Co.
McDonald & Co., D
Pittsburgh Meter Co.
Sprague Meter Co.
Tufts Meter Co., Nathaniel.

Meters—Proportional.

Equitable Meter Co.
Pittsburg Meter Co.

Meters—Regular.

American Meter Co.
Dickey & Co., C. H.
Equitable Meter Co.
Griffin & Co., John J.
Helme & McIlhenny.
Keystone Meter Co.
McDonald & Co.
Pittsburg Meter Co.
Sprague Meter Co.
Tufts Meter Co., Nathaniel.

Meters—Station.

American Meter Co.
Dickey & Co., C. H.
Equitable Meter Co.
Griffin & Co., John J.
Helme & McIlhenny.
McDonald & Co., D
Tufts Meter Co., Nathaniel.

Meters—Steam.

Gas Machinery Co.
United Gas Improvement Co.
Western Gas Construction Co.

Meters—Test.

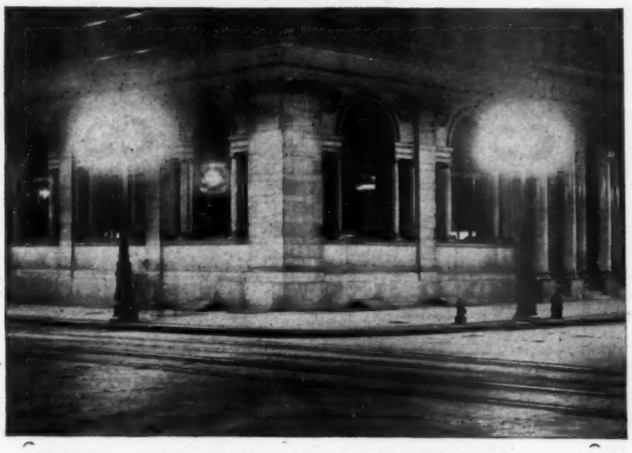
American Meter Co.
Dickey & Co., C. H.
Equitable Meter Co.
Pittsburg Meter Co.
Sprague Meter Co.

Meters—Wet.

American Meter Co.
Helme & McIlhenny.
Pittsburgh Meter Co.
Tufts Meter Co., Nathaniel.

Oil Tanks.

See Holders.



A Bright Corner, Lighted by Pennsylvania Globe High Pressure Gas Lamps.

DEMONSTRATORS AND DEMONSTRATIONS

Do you ever stop to consider in how many lines of merchandising success is secured by means of demonstrations made by competent demonstrators?

Of course the competent demonstrator must have something worth while to demonstrate to make a successful demonstration.

Penns lvania Globe **High Pressure Gas Lamps** provide the ideal means for gas companies to make a convincing demonstration. They are the "latest word" in gas lighting.

With but very little effort any gas company can serve as an efficient demonstrator, by installing in front of its office Pennsylvania Globe **High Pressure Gas Lamps,** with the result that the superiority of this type of lamp would become more widely known and gas lighting service extended to the advantage of all concerned.

THE PENNSYLVANIA GLOBE GAS LIGHT COMPANY,

Manufacturers of High Pressure Gas Lamps,

1934 Market Street, Philadelphia, Pa.

285

Power for Profit

Principles Governing the Use of Machinery and Labor in Modern Buildings

By REGINALD PELHAM BOLTON

Author of "Elevator Service," "Building for Profit," etc.

Consulting Expert Engineer, Member American Institute of Consulting Engineers, Member National Association of Building Engineers

Broad octavo, 11 inches by 8 inches—200 pp. Handsomely bound in cloth for table use. Full index. Marginal notes red lettered for ready reference.

Price, $2.50, post paid. For Sale by AMERICAN GAS LIGHT JOURNAL, 42 Pine Street, New York

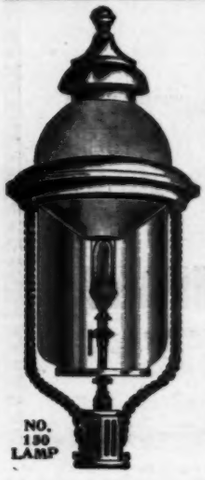
Wiederhold Mantle & Burner Co.

Manufacturers of

HIGH-GRADE MANTLES

Write for Samples and Prices

131-133 Winfield Ave., Jerey City, N. J.



"THE MINER"
GLOBE STREET LAMPS
for
ALL KINDS OF GAS OR BURNERS
Lamp Posts, Cocks and Burners,
Everything Necessary for
STREET LIGHTING

This cut shows our No. 150 LAMP, which is but one of a large variety of designs.
If you are interested in street or park lighting, we want to send you our catalog and prices.

THOS. T. W. MINER
819-823 Eagle Ave., - New York, N. Y.

PUBLIC LIGHTING TABLE FOR JULY, 1916.

COMMUNICATED BY THE AMERICAN METER COMPANY.

Day of Week	MOONLIGHT SCHEDULE.		
	Date.	Light.	Extinguish.
Saturday	1	8.00 P M.	3.30 A.M.
Sunday	2	8.00	3.40
Monday	3	8.00	3.40
Tuesday	4	8.00	3.40
Wednesday	5	9 10	3 40
Thursday	6	9.40	3 40
Friday	7	10.00	3.40
Saturday	8	10.30 F.Q.	3.40
Sunday	9	11.00	2.40
Monday	10	11 40	3.40
Tuesday	11	12 30 A.M.	3.40
Wednesday	12	1.30	3 40
Thursday	13	No L.	No L.
Friday	14	No L. F.M.	No L.
Saturday	15	No L.	No L.
Sunday	16	7.50 P.M.	9 30 P.M.
Monday	17	7 50	10 00
Tuesday	18	7.50	10 30
Wednesday	19	7.50	11 00
Thursday	20	7.50	11 20
Friday	21	7 50 L.Q	11 50
Saturday	22	7 50	12 20 A M.
Sunday	23	7.50	1 00
Monday	24	7.50	1.40
Tuesday	25	7 50	2.30
Wednesday	26	7.50	3.50
Thursday	27	7.50	3 50
Friday	28	7.50	3 50
Saturday	29	7 50 N.M.	3 50
Sunday	30	7.40	4.40
Monday	31	7.40	4.00

What Advertisers Offer to Readers

See Index Page 20 for Manufacturers' Advertisements of Products Listed here.

Outdoor Lighting Fixtures.
See Street Lamps.
Lamp Posts.

Oxide, Iron. Henry Bower Chem. Mfg. Co.

Patents. Burnham, R. E.

Paints.
Dixon Crucible Co., Jos.

Photometers.
American Meter Co.
Connelly Iron Sponge and Governor Co.

Plants—Complete.
See Engineers—Contracting.

Pipe.
Davis & Farnum Mfg. Co.
Donaldson Iron Co.
Sullivan Bros.
Wood & Co., R. D.

Pipe Laying.
New York Lead Wool Co.
Sullivan Bros.
United Lead Co.

Prepayment Meters.
See Meters.

Processes.
See Coal Gas Apparatus.
Water Gas Apparatus.
Hydrogen Gas Apparatus

Producer Gas Plants.
Gas Engineering Co.
Gas Machinery Co.
Western Gas Construction Co.
Wood & Co., R. D.

Provers—Meter.
American Meter Co.
Dickey & Co., C. H.
Equitable Meter Co.
Reime & Molinenny.
McDonald & Co., D.
Pittsburgh Meter Co.

Pumps—Drip.
American Meter Co.

Purifiers.
Bartlett-Hayward Co.
Connelly Iron Sponge and Governor Co.
Cruse-Kemper Co.
Davis & Farnum Mfg. Co.
Gas Engineering Co.
Gas Machinery Co,
Isbell-Porter Co.
Kerr Murray Co.
Stacey Brothers Gas Construction Co.
Stacey Manufacturing Co., The.
United Gas Improvement Co.
Western Gas Construction Co.
Wood & Co., R. D.

Purifying Materials,
Connelly Iron Sponge and Governor Co.
Gas Machinery Co.
Iron Hydroxide Co.
United Gas Improvement Co.

Purifier Trays.
Davis & Farnum Mfg. Co.
Iron Hydroxide Co.
Kerr Murray Co.
Western Gas Construction Co.

Pyrometers.
Brown Instrument Co.

Ranges—Gas.
Crane Co., Wm. M.

Regulators. See Governors.

Retorts—Horizontal and Inclined.
Didier-March Co.
Gardner, Jr., Co., James.
Gas Machinery Co.
Gautier & Co., J. H.
Improved Equipment Co.
Maurer & Son, H.
Missouri Fire Brick Co.
Parker-Russell Mining and Mfg. Co.
Stacey Brothers Gas Construction Co.

Retorts—Silica and Clay.
Improved Equipment Co.
Russel Engineering Co.

Retorts—Vertical.
Gautier & Co., J. H.
Didier-March Co.
Gas Machinery Co.
Improved Equipment Co.
Parker-Russell Mining and Mfg. Co.

Rubber Goods. See also Bags

Screens—Coke.
Beaumont Co., R. H.

Services.
Sullivan Bros.
See also Pipe.

Service Cocks.
American Meter Co
See also Cocks.

Scrubbers.
See Purifiers.

Scrubber Trays.
See Purifier Trays.

Specials. See Pipe.

Steel Construction.
See Iron Work.

Stoking Machinery.
See Charging Machinery

Stoppers—Gas Main.
Safety Gas Main Stopper Co

Storage Tanks.
See Holders.

Street Lamps.
Miner, Thos. T. W.
Welsbach Street Lighting Co.

Structural Iron Work.
See Iron Work.

Tar Extractors.
See Coal Gas Apparatus.
Water Gas Apparatus.

Temperature Controlling Device.
American Gas Furnace Co.

Testing—Commercial and Photometrical.
Chemical Service Laboratories.
Electrical Testing Laboratories.

Testing—Electrical and Mechanical.
Chemical Service Laboratories.
Electrical Testing Laboratories.

Thermometers.
American Meter Co.
Brown Instrument Co.
Gas Machinery Co.

Tools.
Safety Gas Main Stopper Co.

Tubing.
See Rubber Goods

Valves.
Bartlett-Hayward Co.
Davis & Farnum Mfg. Co
Gas Machinery Co.
Isbell-Porter Co.
Kerr Murray Co.
Ludlow Valve Mfg. Co.
Roots Co., P. H. and F. M.
Stacey Brothers Gas Construction Co
Stacey Manufacturing Co., The.
Western Gas Construction Co
Wood & Co., R. D.

Vertical Retorts.
See Retorts.

Washers. See Purifiers.

Water Gas Apparatus.
Bartlett-Hayward Co.
Gas Engineering Co.
Gas Machinery Co.
Stacey Manufacturing Co., The.
United Gas Improvement Co.
Western Gas Construction Co

Water Gas Linings.
Russell Engineering Co.

Water Heaters.
Crane Co., Wm. M.

THE MARYLAND METER

"B" METERS

For Increased Capacity under Slow Speed Operation

ARTIFICIAL AND NATURAL GAS METERS
PREPAYMENT METERS, STATION METERS
METER PROVERS, COMPLAINT METERS, &c.
SPECIAL ATTENTION TO REPAIR WORK

MARYLAND METER WORKS

BALTIMORE—CHICAGO

N. W. REPRESENTATIVE—NORTHWEST GAS EQUIPMENT CO., 1010 SPALDING BUILDING, PORTLAND, ORE.

NATHANIEL TUFTS METER COMPANY

455 COMMERCIAL STREET, BOSTON
Established 1860
MANUFACTURERS OF

GAS METERS

POSITIVE PREPAYMENT GAS METERS THE HINMAN STATION METER DRUM EXPERIMENTAL APPARATUS

A thorough and complete department for METER REPAIRING of All Descriptions

Our readers who preserve their copies for binding are requested to notify us promptly of missing copies. We frequently sell out entire issue.

BOOKS FOR GAS MEN

Accounts, Uniform System of. Published by American Gas Institute. 128 pp. Flexible leather. $5 non-members, $2.50 members.

The system of accounts has been prepared in accordance with the latest thoughts on this subject, and follows closely the principle of accounting promulgated by the various public service commissions throughout the country. This system of accounts is most comprehensive in its scope, the explanations are very clear and the system is so elastic in its application as to make it thoroughly adaptable to the operations of both large and small companies. Embodied in the system is a report form, prepared in accordance with the classification of accounts. This report form, when filled out with the information called for, will enable managers and operators of gas companies to get a clear insight into the detailed operations of their properties, and to tell at a glance where there is a leak or unnecessary expenditure.

Calorific Power of Fuels. By Herman Poole. 255 pages. $3.

Calorimetry is fully and ably discussed in this book. The work decribes methods of determining the heat of combustion. The installation, evaluation and correction of calorimeters for readings is taken up. Calorimeters with a constant pressure and calorimeters with a constant volume, are discussed in two chapters and three chapters are devoted to solid, liquid and gaseous fuels. Tables of heats of combustion of fuels and the report of the committee on boiler tests of the A. S. M. E., with tables of constants used, is added.

Chemistry of Gas Manufacture. By H. M. Royle. $4.50.

This book covers points likely to arise in the ordinary course of the duties of the engineer or manager of a gas works not large enough to necessitate the employment of a separate chemical staff. It treats of the testing of the raw materials employed in the manufacture of illuminating coal gas, and of the gas produced. The preparation of standard solutions is given, as well as the chemical and physical examination of gas coal, including among its contents Preparations of Standard Solutions, Coal, Furnaces, Testing and Regulation. Products of Carbonization. Analysis of Crude Coal Gas. Analysis of Lime. Ammonia. Analysis of Oxide of Iron. Naphthalene. Analysis of Firebricks and Fireclay. Weldom and Spent Oxide. Photometry and Gas Testing. Carburetted Water Gas. Metropolis Gas. Miscellaneous Extracts. Useful Tables.

Coal Gas Residuals. By Frederick H. Wagner, M.E. $2.

The first book to describe in detail the European methods of utilizing coal gas residuals and to explain how they can be applied to American conditions—a work of vital importance to gas companies, chemical engineers, etc. The book is a complete discussion of the Feld theory and practice. It gives full details of standard methods and the latest developments. The author has made thorough investigations of his subject because of the lack of general information on this subject in America, and the consequent waste of natural resources. His work is especially timely. He treats all residuals except coke, which he plans to discuss later in a separate volume. CONTENTS: I.—Tar. II.—Naphthalene. III.—Cyanogen. IV.—Ammonia. V.—Benzol. VI.—Tests.

Coal Tar Distillation and Working Up of Tar Products. By Arthur R. Warnes. With illustrations. $2.50.

A text book for the managers of tar works, coke oven works, gas works, and students of technical chemistry. SYNOPSIS OF CHAPTERS: Coal Tar.—How Tar is Received from Gas Works.—Plant Used in Distillation of Coal Tar.—Plant for Recovering Cresylic and Carbolic Acids from Oil.—The Recovery of Carbolic and Cresylic Acids.—Plant for the Recovery of Benzols, Naphthas, etc.—The Recovery of Benzols and Naphthas.—First Distillation and Washing.—The Rectification of Benzols and Naphthas.—Plant for the Working Up of Pyridine from Pyridine Acid.—The Recovery and Rectification of Pyridine Bases.—Plant for the Manufacture of Crude Naphthalene and Anthracene.—The Manufacture of Crude Naphthalene and Anthracene.—Pitch and Pitch "Getting."—Creosote.—Tar Works Tests.—Appendix.

Manufacture of Sulphate of Ammonia. By Gascoigne T. Calvert. With about 100 illustrations. $3.

A book for the use of practical men. Contains full working details as to the manufacture of sulphate of ammonia. Designed to meet the requirements of large or small makers of sulphate. SYNOPSIS OF CHAPTERS: Sulphate of Ammonia, its Composition and Analysis.—The Raw Materials: Ammoniacal Liquor, Sulphuric Acid and Lime.—Plant required for the Manufacture of Sulphate of Ammonia: General Description, Supply of Ammoniacal Liquor, Tachometer, Superheaters, Stills, Liming Apparatus, Waste Liquor Valves, Cooling Arrangements, etc., Saturators, Drying, Storing, etc., the Waste Gases, etc.—Starting, Working and Stopping the Plant.—Alkali, etc.—Sulphate of Ammonia Manufacture for Small Gas Works.

Carbonization of Coal. By V. B. Lewes. 27 illustrations, 330 pages. $3.

A scientific review of the formation, composition and destructive distillation of coal for gas, coke and by-products. CONTENTS: The Formation, Composition, Classification and Distribution of Coal.—Form of Retorts used in Gas Manufacture.—Coke Ovens and their Development.—Conditions existing in the Destructive Distillation of Coal.—Primary Gaseous Products of the Destructive Distillation of Coal and the Bodies from which it has been formed.—Tar, its Formation, Use and Decomposition.—Coke.—Nitrogen and Sulphur of Coal and their Recovery.—Modern Coal Gas.—Appendix. The chemical and mechanical principles involved in the destructive distillation of coal are carefully pointed out and the work of various investigators critically presented, together with much data gathered from the author's own recent investigations, and he attempts to define the probable lines along which future advances in the carbonization of coal may be expected.

Handbook for Gas Engineers and Managers. By T. Newbigging. Eighth edition. 217 illustrations, 596 pp. $6.50.

CONTENTS: Coal.—Chief Kinds of Coal.—Storage of Coal.—Analyses of Coals and Cannels.—Spontaneous Ignition of Coal.—Gases Occluded in Coal.—Testing of Coal for its producing Qualities..—Specific Gravity of Coal.—Coal Distillation.—Gas Production.—Retort House.—Stack.—Retorts.—Heating of Retorts.—Inclined Retorts.—Machine Charging and Drawing.—Analysis of Furnace Gases.—Retort Bench Mountings.—Hydrocarbon and Other Gases and Vapors.—Retort House Tools and Appliances.—Condensation.—Naphthalene.—Condensers.—Exhausters.—Steam Engines and Boilers.—Washers.—Tower Scrubbers.—Washer-Scrubbers, etc.

Distribution of Gas. By W. Hole. Third edition. 687 illustrations, 865 pages. $7.50.

CONTENTS: Rights and Duties of Gas Undertakings.—Preliminary Considerations.—Discharges from Pipes under High Pressure.—Station Governors.—Cast Iron Pipes and Irregulars.—Steel Pipes and Connections.—Joints and Jointing.—Main Laying.—Valves and Main Cocks.—Subways.—Service.—Wet, Dry, Prepayment, and Fixing Meters.—Pipes and Joints for Internal Fitting.—Internal Fitting and Lighting.—Gas Fires and Cookers.—Gas Engines.—Pressure Gauges and Registers.—Complaints and Repairs.—Gas as an Aid to Ventilation. Public Lighting: Low Pressure, Self-Intensifying and High Pressure Systems.—Lighting and Extinguishing Lamps.—High Pressure Distribution and Transmission.—Compressors.—High Pressure.—Distributing Apparatus.—Internal Lighting and Heating.—Unaccounted-for Gas.—Fusion and Electrolysis.—Appendix. A complete and comprehensive treatise, embodying all that is required as an outfit on the subject of distribution, not only to students, but also to managers of gas works. This new edition has been much enlarged and brought up to date by the addition of much new matter and the careful compression of the old material.

Handbook of American Gas Engineering Practice. By M. Nisbet Latta. Illustrated, 477 pages. $4.50.

CONTENTS: Water Gas Manufacture: Generator.—Carburetter.—Superheater.—Wash Box and Tar.—Scrubbers.—Condensers.—Purifiers.—Exhausters.—Station Meters.—Holders.—Works Operation. Gas Distribution: Naphthalene.—Mains.—Services.—Consumers' Meters.—Pressure.—House Piping.—Appliances.. General Technical Data: Properties of Gases.—Steam.—Mathematical Tables.—Conversion Factors.—Pipe and Miscellaneous Data.

Coal Tar and Ammonia. By George Lunge, Ph.D. 305 illustrations, 1,210 pages. Complete in two volumes. $15.

CONTENTS: Process of Obtaining Coal Tar.—Properties of Coal Tar and its Constituents.—Applications of Coal Tar without Distillation.—First Distillation of Coal Tar.—Pitch.—Anthracene Oil.—Creosote Oil.—Carbolic Acid and Naphthalene.—Light Oil and Crude Naphtha.—Working up the Light Naphtha into its Final Products.—Sources from which Ammonia is Obtained.—The Composition and Analysis of Ammoniacal Liquor and Properties of its Constituents.—The Working up of Ammoniacal Liquor.—Other Technically Important Ammonium Salts.—Appendix and Addenda.

Gas Piping and Gas Lighting, The American Practice of. By William Paul Gerhard, C.E. 310 pages. $3.

This book is written in a lucid and popular style, quite free from technicalities, and contains a large amount of well-digested and useful information. The author has avoided treating the various processes of manufacture and distribution, but takes up the subject of installation and gas utilization practically at the point where it reaches the consumers' premises. Besides that part of the text addressed particularly to the gas user, will be found many data and specifications of interest and value to the engineer, architect and builder.

Liquid and Gaseous Fuels and the Part they Play in Modern Power Production. By V. B. Lewes. Illustrated, 348 pp. $2.

CONTENTS: Combustion.—Formation and Composition of Fuel.—Determination of Calorific Value.—Liquid Fuels.—Use of Liquid Fuels.—Liquid and Gaseous Fuels.—Manufacture of Coal Gas.—Use of Coal Gas for Heating and Power.—Water Gas.—Poor Fuel Gas.—The Fuel of the Future.

Gas Engine Design. By C. E. Lucke. With figures and diagrams. Second edition. 145 illustrations, 262 pages. $3.

CONTENTS: Power.—Efficiency.—Forces in the Engine Due to Gas Pressure and Inertia.—Dimensions of the Engine Parts.

BOOKS FOR GAS MEN

Public Lighting by Gas and Electricity. By W. J. Dibdin. With tables, diagrams, engravings and full-page plates. 537 pp. $8.

CONTENTS: Artificial Light.—Photometers.—Illuminating Properties.—Physical and Chemical Properties of Coal Gas.—Jet Photometer.—Enrichment.—Gas Burners and Meters.—Incandescent Gas Lighting.—Self-Intensifying Gas Pressure.—Anti-Vibrators.—Lamp Governors.—Torch Lighting and Extinguishing.—Lighting Tables.—Heating Value of Coal Gas.—Generation of Dynamic Electricity.—Generators.—Motors.—Transformers.—Measurement of Current.—Distribution of Light.—Efficiency of Arc and Incandescent Lamps.—Comparison of Cost and Heating Effect of Lighting by Gas and Electricity.—Examples of Direct and Alternating Current Lighting Systems.—Acetylene.—American Experience.

Regulation, Valuation and Depreciation of Public Utilities. By Samuel S. Wyer. 313 pages. $5.

This book is not a brief for either the public or the public utilities, but is a discussion and compilation of pertinent, economic, engineering and legal facts relating to both sides. It is a discussion of basic principles, with digested opinions of experts and judicial decisions of our courts. It is an encyclopædia for the man that reads or writes on the subject of public utilities.

Gas Analyst's Manual. By Jacques Abady. 500 pages. $6.50.

CONTENTS: Chapters on Photometry.—Standards of Light.—Calorimetry and Specific Gravity.—Referee's Test for Sulphur and Ammonia.—Coal Testing.—Testing, Enrichment and Purification Materials.—Purity Tests for Gas in Various Stages of Manufacture.—Testing By-Products.—Technical Gas Analysis.—Meter and Governor Testing.—Tables and Data.

The By-Products of Coal Gas Manufacture. By K. R. Lange. 13 illustrations and diagrams, 164 pages. $2.

CONTENTS: Introduction.—Chapter I. Purification of Coal Gas.—Chapter II. Coke.—Chapter III. Retort Graphite.—Chapter IV.—Gas Tar.—Chapter V. The Gas Liquor: Testing Gas Liquor, Treating the Gas Liquor, The Distillation of Gas Liquor, Working the Still, Preparation of Concentrated Gas Liquor, Preparation of Ammonia, Liquefied Ammonia, Sulphate of Ammonia.—Chapter VI. The Treatment of the Gas-Purifying Agents, Eliminating the Sulphur by Extraction, Lixiviating the Purifying Material, Treating the Liquor, Treating the Extracted Material.—Chapter VII. Treating the Cyanogen Sludge.—Chapter VIII. Treating the Crude Liquors: First, Precipitation with Iron Salts. Second, Precipitation with Ammonium Salts. Third, Precipitation with Potassium Salts.—Chapter IX. The Treatment of Crude Ammonium Thiocyanate and Cuprous Thiocyanate.—Chapter X. Potassium Ferricyanide.—Chapter XI. The Cyanogen Pigments.—Chapter XII. Sulphur and Sulphuric Acid.—Index.

Testing of Gas and Gas Meters. By C. H. Stone. 322 pages, 50 illustrations. $3.25.

The aim of this book has been to explain clearly simply and fully such tests as would be of practical service to the gas manager, chemist or photometrist, and to make such comments and suggestions as might guide him in his choice of apparatus or process and assist him to secure accurate and useful results therewith. For this reason all chemical processes, reactions and calculations have been explained at length. Divided into four parts: Photometry, Chemical Tests, Calorimetry, Specific Gravity and Pressure-Testing of Meters.

Modern Illuminants and Illuminating Engineering. By Leon Gaster and J. S. Dow, London, England. 462 pages, 204 illus-illustrations. $5.

The authors have treated the subject in broad general lines. The initial portion of the book is devoted mainly to the various illuminants, the central portion to photometry and the effect of light on the eye, and the last part to practical lighting problems. The authors have brought together a vast amount of matter not usually available in a single volume, and treated the subject somewhat different from that adopted in previous text. In your field of public and private lighting a degree of expert knowledge is called for nowadays such as was not thought of even a few years ago. Illuminating is now classed with the engineering professions, and an understanding of its principles is demanded on the part of the chief of every electric lighting and gas company. This book contains exactly the information you will find most useful in your special field. It is up to date in every particular, being written by two of the leading expert authorities on illumination. So many advances have been made in the last few years in the systems of lighting factories, schools, theatres, houses, streets, etc., that only the expert has been able to keep abreast of them. New methods have been devised for measuring illumination, for testing fixtures and determining the best type for any purpose, the calculation of illuminating efficiency, the best spacing and arrangement of lights, etc. Lighting companies are expected to be posted on all these subjects. This book gives you the results of expert knowledge in the best and most available form. Every topic of illuminating engineering is fully covered in simple and non-technical style.

Industrial Chemistry. A manual for the student and manufacturer by forty eminent specialists. Edited by Allen Rogers, in charge of Industrial Chemistry, Pratt Institute, Brooklyn, N.Y. 1,025 pages. $5.

"This book is well printed, well bound and shows the results of careful proof-reading. To get out such a work is a great undertaking and the editor is to be congratulated on the degree of success he has attained. Technical libraries, chemists, engineers and teachers will find this volume a necessary addition to their works on industrial chemistry."—PROF. M. C. WHITAKER, reviewing the first edition in the Journal of Industrial and Engineering Chemistry, November, 1912.

Public Utilities, their Fair Present Value and Return. By Hammond V. Hayes, Ph.D. 213 pages. $2.

A discussion of the line of reasoning which must be followed whose duty it is to ascertain the fair present value of a property after an appraisal has been made and all the necessary information relative to it has been obtained. Likewise the subjects of going value and depreciation have been treated at some length with the hope of removing some of the existing misunderstandings concerning them. The present work advocates the use of a method of valuation somewhat different from those that have been pursued in the past in that the use of overhead charges has been reduced to a minimum. It is believed that this method of caring for the costs usually claimed as overhead charges will tend to greater accuracy and will eliminate much future controversy. The discussion is confined entirely to public utilities subject to regulation by state or governmental authorities. CONTENTS: The Present Controversy.—Ascertainment of Fair Present Value.—Basis for Fair Charges for Service for New Company.—Basis for Fair Charges for Service for a Previously Unregulated Company.—Non-Competitive Successful Undertakings.—Non-Competitive Unsuccessful Undertakings.—Fair Value of Property of Competitive Undertakings.—Fair Rate of Return.—Replacement Cost.—Cost of Promotion; Physical Property; Going Value.—Actual Original Cost.—Going Value.—Depreciation.

Text Book of Gas Manufacture. By John Hornby. 408 pp. $3.

The book is intended for young men just starting their career in a gas works, and for students preparing for the examination in gas engineering. The object which has been kept in view has been to describe the general features of modern gas manufacture, and to explain the points to which special attention must be paid, in order to obtain economical results in working. It is not intended to be an exhaustive treatise on the subject, the student will be able to fill in details from his own experience on the particular works he may be connected with; at the same time it supplies a groundwork which should save him considerable labor in obtaining his preliminary knowledge.

Brown's Directory of American Gas Companies. 800 pp. $5.

This book is revised annually and contains a list of gas companies in the United States, Canada and Mexico selling both Artificial and Natural Gas, a list of Public Service Commissions, and a list of members of all the Associations, arranged alphabetically. This book should be in the hands of every gas man and those doing business with gas companies.

Gas Engineers' Pocket-Book. By H. O'Connor. Full leather. 478 pages. $3.50.

Comprising tables, notes and memoranda relating to the manufacture, distribution and use of coal gas and the construction of gas works. Third Edition. Revised.

FOR SALE BY

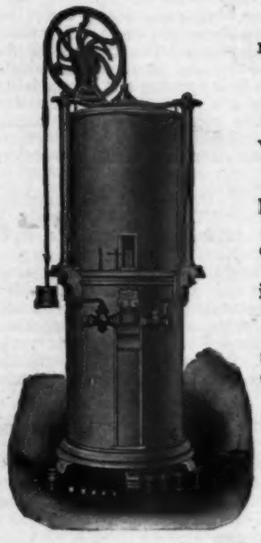
American Gas Light Journal,

42 PINE STREET, NEW YORK CITY.

NEW YORK PHILADELPHIA CHICAGO

THE AMERICAN METER COMPANY

Established 1884



Following are some of the improvements which we have recently made in our

METER PROVERS

Bell inclosed, or surrounded by a jacket, thereby preventing drafts from affecting the accuracy of the machine.

Hollow steel columns in place of wooden posts.

Water thermometer and air thermometer on the same level.

Siphon Gauge placed as near as practicable on the level of the eye of the operator.

Larger cocks and hose, so that meters of greater capacity can be proved on the five-foot machine.

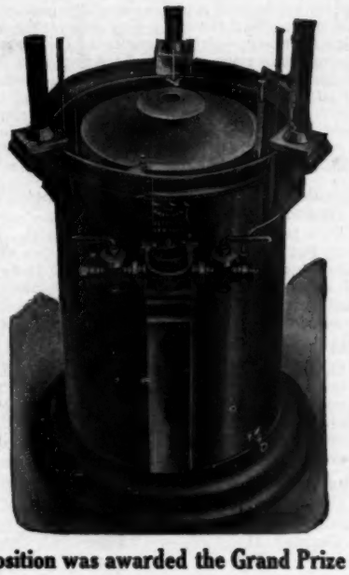
An improved air valve. Wire wound loose.

Annular tank meterially reducing the amount of water, so that the temperature of the same can be more readily changed.

A new adjustable pointer on the scale, so that it can be more easily and accurately read.

Feet with adjustable screws to facilitate the leveling of the prover, also permitting circulation of air underneath.

CATALOGUE SENT ON REQUEST



Our apparatus in the Collective Gas Exhibit at the Panama-Pacific International Exposition was awarded the Grand Prize

NEW YORK, 11TH AVENUE AND 47TH STREET

Save 65% of the money you spend for meter maintenance by installing Sprague Meters

SPRAGUE METER CO.

Bridgeport, Conn.

Los Angeles, Cal. Davenport, Iowa. San Francisco, Cal.

"EMCO" METER

METERS AND REGULATORS

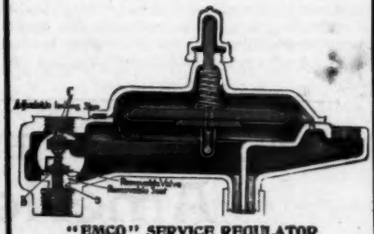
for NATURAL and ARTIFICIAL GAS

Sizes 3-4 inch to 24 inches

Catalogue on Application

EQUITABLE METER COMPANY

422-434-436 First Ave., Pittsburgh, Pa.



"EMCO" SERVICE REGULATOR

ESTABLISHED 1855.

McDONALD METERS

NOTED FOR ACCURACY.

CONSUMERS' METERS, REGULAR AND PREPAYMENT.
STATION METER WORK OF EVERY DESCRIPTION.
METERS REPAIRED. METER PROVERS.
CORRESPONDENCE SOLICITED.

D. McDONALD & CO.,

NEW YORK. ALBANY, N. Y. CHICAGO.

ACCURACY

"We have built our reputation around that word."

Mr. Gas Man:--When you consider the question of
METERS
The thing you should think of is
Accuracy.

Send for Catalogue on "A" Meters

KEYSTONE

Meter Company, Royersford, Pa.

Repairing a Specialty

Place the Responsibility

for tallying every cubic foot of gas delivered to your consumers, upon

IRONCLAD

THE 100% METER

The "Ironclad" Dry Gas Meter has been held strictly accountable for years, by hundreds of gas companies, in registering accurately all the gas delivered their consumers.—It has rendered this service faithfully, and at the lowest cost,—because—

"Ironclad" Maintenance is lowest—none excepted.

Pittsburgh Meter Company

General Office and Works: East Pittsburgh, Pa.

New York, 149 Broadway. Seattle, 802 Madison St. Kansas City, 6 W. 10th St.
Chicago, 5 South Wabash Ave. Columbia, S. C., 1433 Main St.
Los Angeles, 631 So. Spring St.

THE WESTERN GAS CONSTRUCTION COMPANY
WORKS AND MAIN OFFICE FORT WAYNE IND U S A
GAS ENGINEERS
EASTERN OFFICE NEW YORK CITY.
Broad Exchange Building.
WESTERN OFFICE SAN FRANCISCO.
86 Third Street.
Get the BEST Results!
For every fuel there is one best proportion of "down runs." That's where the WESTERN reversing valves make good every time,---doing their part to reduce the cost of your water gas.
Where next to the path of the blast gases, the upper valve, the "hot valve," is protected with tiles not less than three inches thick, and these parts of the valve are solid steel. This is an easy working, substantial valve,—built to go.
Ready access, through a quick opening door, to the interior of the lower (down-run) valve, means easy removal of clinkers and ashes.
Easy operation guaranteed; an adjustable counterbalance takes away the heavy load.
And remember those two ash-pockets,---the less ashes sent to your carbureter the better results.
An all-steel Expansion Joint takes care of heat strains.
Best results from your oil,—a vital problem also,—will be taken up in our next "ad."
"EVERYTHING FOR A GAS PLANT"
CONTRACTORS AND BUILDERS
EVERYTHING FOR A GAS PLANT